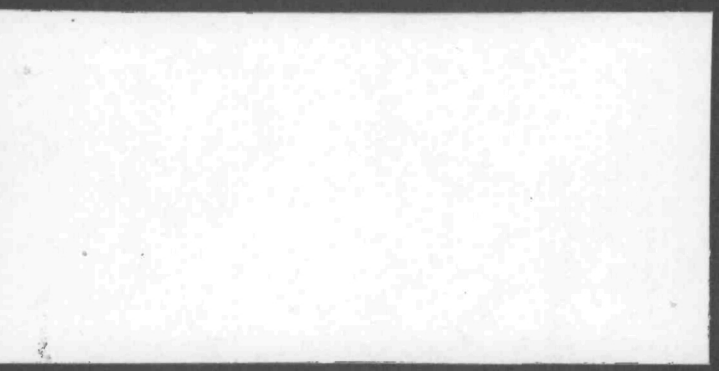
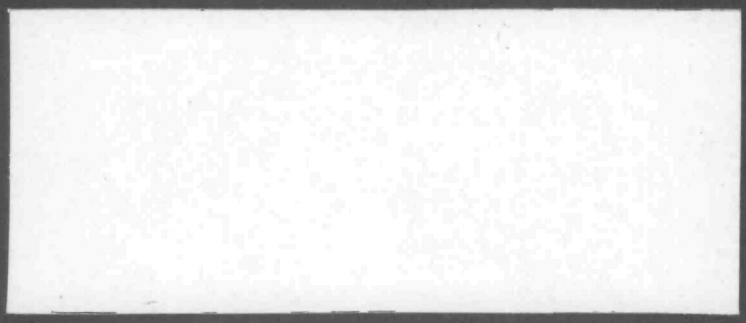
TABLE OF CONTENTS

ES

ROSE CHEMICAL

HOLDEN, MO





SUBMITTED BY
Chemical Waste Management, Inc.
ENRAC Division

ROSE CHEMICALS SITE

EMERGENCY CONTINGENCY PLAN

INDEX

SECTION

APPENDICES

EMERGENCY CONTINGENCY PLAN

ROSE CHEMICALS SITE

1.0 INTRODUCTION

This contingency plan is a description of the procedures to be implemented in the unlikely event of a release or the imminent threat of release involving hazardous materials from the Martha Rose Chemical Company during site stabilization activities. These activities include the removal of flammable and combustible hazards as well as other significant environmental hazards present at this site. This plan shall be utilized, as necessary, to minimize hazards to human health and the environment near this site during these stabilizing actions. This plan will also serve as a basis for additional planning when general site clean up begins at a later date.

This plan has been developed pursuant to the U.S. Environmental Protection Agency (EPA) regulations and guidelines.

2.0 SITE DESCRIPTION

The Martha C. Rose Chemicals, Inc. site is located at 500 West McKissock, Holden, Missouri. The site functioned as a storage, processing, and disposal facility for PCB materials. The company has terminated its operations, leaving behind a large number of drums, tanks, and transformers containing PCB liquids in addition to PCB contaminated solids and debris.

3.0 DESIGNATION OF SITE MANAGER

The Site Manager for the Rose Chemicals site is the Clean Sites, Inc. Project Manager. This individual is responsible for controlling all work at the site in an environmentally-safe manner, assuring that operational hazards are minimized and implementing this plan as required by proposed work or environmental concerns.

Site Manager:	Clifford W. Kline
Company:	Clean Sites, Inc.
Street:	500 West McKissock
Town:	Holden
State:	Missouri Zip Code: 64040

Site Manager can be reached after hours at:

Street:	112 Independence Avenue, Apt. 808
Town:	Lee's Summit
State:	Missouri Zip Code: 64063
Phone #:	816/524-6260

4.0 INCIDENTS REQUIRING IMPLEMENTATION OF THIS PLAN

In the highly unlikely event of a release of hazardous material into the environment, fire or explosion which may present a threat to human health or the environment, the Site Manager must assess the hazard presented by the incident and notify all personnel on site. If there has been a release of contaminated material into the environment, the Site Manager shall immediately notify the following state and federal agencies:

Missouri Depart of Natural Resources	314/634-2436 (24 hrs.)
and	
U.S. Environmental Protection Agency	913/236-3778 (24 hrs.)

Additionally, the Site Manager shall notify, as appropriate, local police, fire and/or emergency response teams for assistance. The police will be requested to maintain site security and direct traffic. Fire departments assisting in an emergency will be asked to supply equipment and personnel. The following is a list of notification numbers pertinent to this plan:

POLICE ASSISTANCE

Holden Police	(816) 732-5527
Johnson County Sheriff	(816) 732-5527
Missouri Highway Patrol	(816) 524-9200 (Emergency)

FIRE ASSISTANCE

Holden Fire Department	(816) 732-5527
Johnson Co., Fire-Dist. #1	(816) 747-3456
Warrensburg Fire	(816) 747-6348
Lee's Summit Fire	(816) 251-2360
Kansas City, MO-Fire	(816) 531-2121
Whiteman AFB-Fire	(816) 687-3417
Richards Gebaur AFB-Fire	(816) 348-2117

MEDICAL ASSISTANCE

Ambulance Service	(816) 732-5527
Hospital	
Western Missouri Medical Center	
Burkharth Road	
Warrensburg, Missouri	(816) 747-3181

Missouri Poison Control (816) 234-3000

Centers for Disease Control (Atlanta) (404) 452-4100 (Emergency)

An Emergency Contact List as well as a list of local emergency numbers in addition to those shown above are shown in Appendices A and B.

The Site Manager shall stop all normal site operations and take all necessary measures to terminate and/or mitigate the on-site emergency. In the event of an on-site emergency, the on-site alarm (compressed-gas boat horn) will be activated, resulting in short screeches one after another for approximately 10 seconds. All available on-site personnel should report to the on-site assembly areas for instructions (see Appendix E). Notation in the official site log shall be made by the Site Manager or his designated representative. Such notation shall include the date, time and pertinent details of the incident that required activation of this plan.

A. <u>Spills of Liquids</u>

The proposed actions at this site entail the transfer and removal of significant quantities of PCB-contaminated fluids as well as some uncontaminated liquids. For the purpose of this plan all liquids shall be assumed to be contaminated and handled as such within the plant confines.

Spills may occur from the tanks present at the site, rupture of transfer hoses, leakage from pumps or from the receiving tank. To assure that these transfer and removal operations will not result in an uncontrolled release to the environment, a compacted earthen berm will be constructed along the

western side of the property prior to conducting any liquid transfer operations. This berm shall be at least 8-inches high and shall be continuous along a line sufficient in length to contain all liquids in storage areas including those within the building on site. Spillage resulting from these transfer and removal activities will be handled by:

- Immediately shutting down the affected system if appropriate,
- Deployment of sorbent material to absorb the spilled material,
- Excavation of the contaminated soil and
- Drumming of the contaminated sorbents and soils for appropriate disposal at a later date.

In the event of spillage, the Site Manager will immediately notify EPA and the Missouri Department of Natural Resources (MDNR). The Site Manager will evaluate the capabilities to handle the situation with available resources. If the spill exceeds on-site capabilities, additional resources will be requested. A reasonable supply of sorbent materials will be available on site in close proximity to all phases of the liquid transfer operations. The Site Manager will be responsible for daily inspection of tank and berm integrity throughout this work effort. Included in this inspection shall be the maintenance of adequate free board within the holding pond, located on-site and the established containment structures existing at the site. If it becomes necessary to remove water from any of these structures, the water shall be tested for PCB content prior to drainage. Prior to any discharge to waterways (sewers, creeks, etc.) approval must be granted by MDNR and EPA. EPA personnel shall be notified of the proposed release and may delay such release until an

official observer can be present to observe/sample such discharge.

B. Flammable Materials

The transfer and removal of any flammable materials present at this site may result in the release of PCB's to the environment and present the danger of fire or explosion. The Material Safety Data Sheet shown in Appendix F gives fire and explosion and other data on PCBs. In light of the potential hazards, the following actions shall be taken.

- Fire extinguishers, approved for flammable liquids as well as flammable metals, will be in close proximity to the operational area.

- No ignition sources shall be permitted within fifty (50) feet of any portion of the operational area.

- In the event of spillage or transfer line rupture, all ignition sources will be shut down in the vicinity of the spilled material.

- A warning horn (compressed-gas boat horn or equivalent) will be used as the alarm for ignition shut down.

- Immediate deployment of sorbent materials will be effected to absorb the spillage in the case of flammable liquids.

- Contaminated soils will be removed.

- The contaminated sorbents and soils will be containerized for appropriate disposal later.

In the event of a fire or explosion, the Site Manager shall immediately activate the above-described notification process. The Site Manager shall then evaluate whether the situation can be controlled by on-site personnel or if additional resources are required. Based on this evaluation, the Site Manager shall take appropriate actions to extinguish the fire. At the earliest possible time in this situation, the Site Manager shall notify EPA and MDNR.

C. Special Fire Fighting Training

The Holden Fire Department is a volunteer organization. The Rose Chemical Site represents a potential hazardous chemicals type of fire rarely encountered by this local fire department. To assist the Holden Fire Department learn more about hazardous chemicals fires involving PCBs and more specifically how to fight any fire that might start at the Rose site, a special 12 hour course will be held for all Holden volunteer firemen, police, and ambulance service personnel.

The special course will be presented in Holden, Missouri by the University of Missouri Fire and Rescue Training Institute, Columbia, Missouri. The course will include classroom lecture training and also some hands-on demonstration of equipment and effective techniques to extinguish hazardous chemical fires.

After the training of the Holden Fire Department has been evaluated, other surrounding community fire departments may be offered the same training.

D. **Adverse Weather Conditions**

- Windstorms - The hazards posed by high winds will affect the construction of the containment berm and the fencing operation only. During periods of high winds, the Site Manager shall insure that no excavations are occurring which could result in the migration of contaminated soils off site. In the event that high winds persist to the point of endangering successful progress, dust suppression techniques such as water sprays to wet soils, or suspension of operations resulting in high levels of dust shall be initiated by the Site Manager.

- Rainstorms - Rains of such intensity as to hinder or jeopardize the successful completion of work in progress shall be grounds for the Site Manager to suspend or terminate the work effort for that day. A significant threat of rain during the removal of any metallic sodium shall be grounds for the Site Manager to postpone the operation until such time as the Site Manager feels it can safely be accomplished. In the event of severe lightning, the Site Manager shall, at his discretion, suspend all work activities. Finally, the Site Manager shall assure that rainfall events do not significantly degrade the containment devices at the site. In the event that degradation does occur, the Site Manager shall take appropriate action to mitigate or reinforce such devices.

  During this proposed operation, the Site Manager shall insure that adequate free board, to contain runoff from significant rainfall events, is maintained in the SPCC runoff pond located on-site. Additionally, the Site Manager shall assure that all site operations are con-

ducted in such a manner as to prevent significant oily waste runoff to this pond. These requirements can be addressed during the daily inspection stipulated previously.

E. **Personal Exposure to PCB's**

If, due to a failure in the protective equipment specified in the health and safety plan for this activity, any person on-site comes into intimate contact with PCB's or suspected PCB-contaminated materials; that person shall immediately proceed to the decontamination area for decontamination and potential removal to an approved medical facility. If any individual or the Site Manager believes an individual has experienced PCB exposure, that individual shall be transported to the hospital in Warrensburg for appropriate examination, observation and/or treatment. The quickest route to the hospital is shown on the map in Appendix C.

F. **Adverse Community Actions**

The potential for adverse community actions must be considered based on the past history of this site. In the event of adverse community reaction, the Site Manager shall immediately notify EPA. If the removal actions, the health and safety of the site workers or the health and safety of members of the community is being jeopardized; the Site Manager shall, with concurrence from EPA/MDNR, seek the assistance of the local police or the Missouri Highway Patrol.

G. **Decontamination**

No equipment shall depart from the site until reasonable and appropriate decontamination has been performed. In the event that adequate decontamination can not be performed, any effected equipment shall be placed in an unobtrusive portion of the site, secured to the extent possible and left in that position until adequate decontamination can occur.

Prior to departure from the site, equipment shall undergo a wipe test to assure that decontamination procedures have been effective. The Centers for Disease Control (CDC) has recommended that equipment be decontaminated to less than 0.7 mg/100 cm^2 PCBs.

5.0 EMERGENCY MATERIALS

The Site Manager shall maintain fire extinguishers at all operational locations. The Site Manager will assure that individuals overseeing each transfer operation have at least one working compressed air horn or comparable warning device. The Site Manager shall also be responsible for assuring that adequate supplies of sorbent materials are available at the site. The Site Manager will designate the most advantageous locations for these materials to be positioned. Additionally, the Site Manager will designate any other emergency equipment he feels appropriate or necessary to the efficient and safe completion of this removal action.

The following equipment will be available for on-site use:

Equipment & Materials	Usage
1. Shovels, rakes & brooms (spill "kits") - (20 each)	Clean up spills
2. 55-gallon open-top drums 17 H (type) - (50 each) 85-gallon overpacks - (50 each)	Containerizing material
3. 50 lineal feet absorbant boom	Stop spread of oil on waterways
4. 10 bales of absorbant pads	Clean up surface spills
5. 20,000 gallon emergency storage tank	Transfer liquids from leaking tanks and spills
6. Caterpillar 426 backhoe	Construct berms and trenches
7. 100 bags of "oil-dry" absorbent materials	Clean up spills
8. 3" pump with suction and discharge hose	Transfer liquids from tanks, ponds, etc.
9. Fire extinguishers (type and number)	Put out small fires at source
10. SCBA's (#), personnel protection equipment, (acid suits, saranex, gloves, boots, etc.)	Fire emergency
11. First aid equipment	On-site medical emergencies

6.0 EVACUATION PLAN

Facility personnel will be evacuated if the Site Manager decides that their personal safety is in danger. If evacuation is necessary, hand held air horns will be used to notify all on-site personnel. Evacuation will take place through the main gate to McKissock Street. If this gate is blocked, evacuation will take

place through the auxiliary gate onto 2nd Street. NOTE: This gate is usually locked.

In the event that an area outside the facility requires evacuation, the Site Manager will contact the Holden Police Chief.

If a major fire should occur in the main warehouse or the south warehouse on the Rose Site, residents living downwind will be warned as quickly as possible. The existing emergency response center in Warrensburg, Missouri is the best way to do this. The procedure is as follows:

1. Should a fire be discovered on the site, the Rose Site security guard will call the Warrensburg, Missouri Emergency Response Center at 732-5527.

2. The response center communicates immediately by radio to the Holden Police Department, the Johnson County, Missouri Sheriff Department, and the Missouri State Highway Patrol and can request resistance for fire fighting, road blocks, and to warn people living downwind from the fire when and how to evacuate to a safe area if necessary.

Clean Sites, Inc. working with the PRP Technical Subcommittee of the Rose Chemical Steering Committee will make dispersion calculations for hazardous chemicals that might be carried away from the site. Based on these calculations, a map overlay will be made that can be used to determine the downwind area that should be warned or advised to evacuate.

A meeting has been held with Lt. Ulm and the Missouri State Highway Patrol to discuss how they would help seal off downwind areas to traffic and to warn people in the areas how and when to evacuate. They will work with the Holden Police Chief and utilize as many patrol units as necessary.

APPENDIX A

PROCEDURE:	Security	DATE:	3/1/84
SEGMENT:	Emergency Response	INDEX:	BE-2001
TOPIC:	Emergency Contacts	PAGE:	3

EMERGENCY CONTACT LIST

PROJECT: MARTHA C. ROSE CHEMICALS

EMERGENCY CONTACT	PHONE NUMBER
POLICE	816/732-5527/5528
FIRE	816/732-5527/5528
ENRAC	816/732-4334
ENRAC CONTACTS	PHONE NUMBER
PROJECT MGR.: Mark Henke	816/429-2183
PROJECT COORD.: J. Dearman	816/429-2183
SAFETY COORD.: J. Wallwork	816/429-2183
TEAM LEADER: Kevin Staton	816/429-2183
TEAM LEADER: Jerry Cross	816/429-2183
PROJECT MANAGER CLEAN SITES	PHONE NUMBER
C. KLINE	SITE: 816/732-5520 Lee's Summit, MO: 816/524-6260 Lake Jackson, TX: 409/299-1147
J. Hollingsworth	816/747-8744
HOSPITAL	816/525-2950
RESEARCH EAGLE 1 Helicopter	800/637-4300
LIFLIGHT 2 Helicopters	816/942-4400

E

APPENDIX B

EMERGENCY NUMBERS

Doctors Numbers	Hospitals	Ambulance Service
	WARRENSBURG	
	747-3181	732-5527

FIRE

Local Fire 732-5527

Centerview	Dial access 7 & 747-3456	La Monte	827-0052
Chilhowee	678-2211	Leeton	653-4544
Concordia	463-7900	Sweet Springs	335-4557
Emma	463-2244	Warrensburg	
Holden	732-5527	City	747-3456
Kingsville	732-5527	Rural	747-3456
Knob Noster	563-2233	Whiteman AFB	687-3717

POLICE

Local Police 732-5527

Centerview	Dial access 7 & 747-2265	La Monte	827-0052
Chilhowee	678-2211	Leeton	653-4544
Concordia	463-7515	Sweet Springs	335-6823
Emma (Lafayette Co)	259-3622	Warrensburg	
(Saline Co)	886-5511	City	747-3322
Holden	732-5527	or	747-9133
Kingsville	732-5527	Whiteman AFB	687-3700
Knob Noster	563-2233		

SHERIFF

Local Sheriff 732-5527

Centerview	Dial access 7 & 747-2265	La Monte	827-0052
Chilhowee	678-2211	Leeton	653-4544
Concordia	463-7515	Sweet Springs	1 + 886-5511
Emma (Lafayette Co)	259-3622	If no answer	1 + 886-5513
(Saline Co)	886-5511	Warrensburg	747-5511
Holden	732-5527	If no answer	747-2265
Houstonia	1 + 827-0052		
Kingsville	732-5527		
Knob Noster (Johnson Co)	747-5511		
If no answer	747-2265		

STATE HIGHWAY PATROL

Local Hwy. Patrol _____

General Information ..... 1 + 524-1407
Emergency Only ..... 1 + 524-9200
(Toll calls)

Other emergency numbers

Child Abuse or Neglect
Toll Free ..... 1 - 800-392-3738
Federal Bureau of Investigation (FBI)
Kansas City, Mo ..... (Toll Call) 1 + 221-6100
Missouri State Water Patrol ..... (Toll Call) 1 + 314-751-3333
National Center for Missing and Exploited Children
Toll Free Dial "1" & Then 800-843-5678

Poison Control Center
St. Louis, Mo ..... Toll Free Dial "1" & Then 800-392-9111
To report a Tornado
Call your nearest Law Enforcement Agency.
U.S. Marshall, Kansas City ..... (Toll Call) — 1 + 374-3521
If no answer, call ..... 1 + 703-285-1100

APPENDIX C

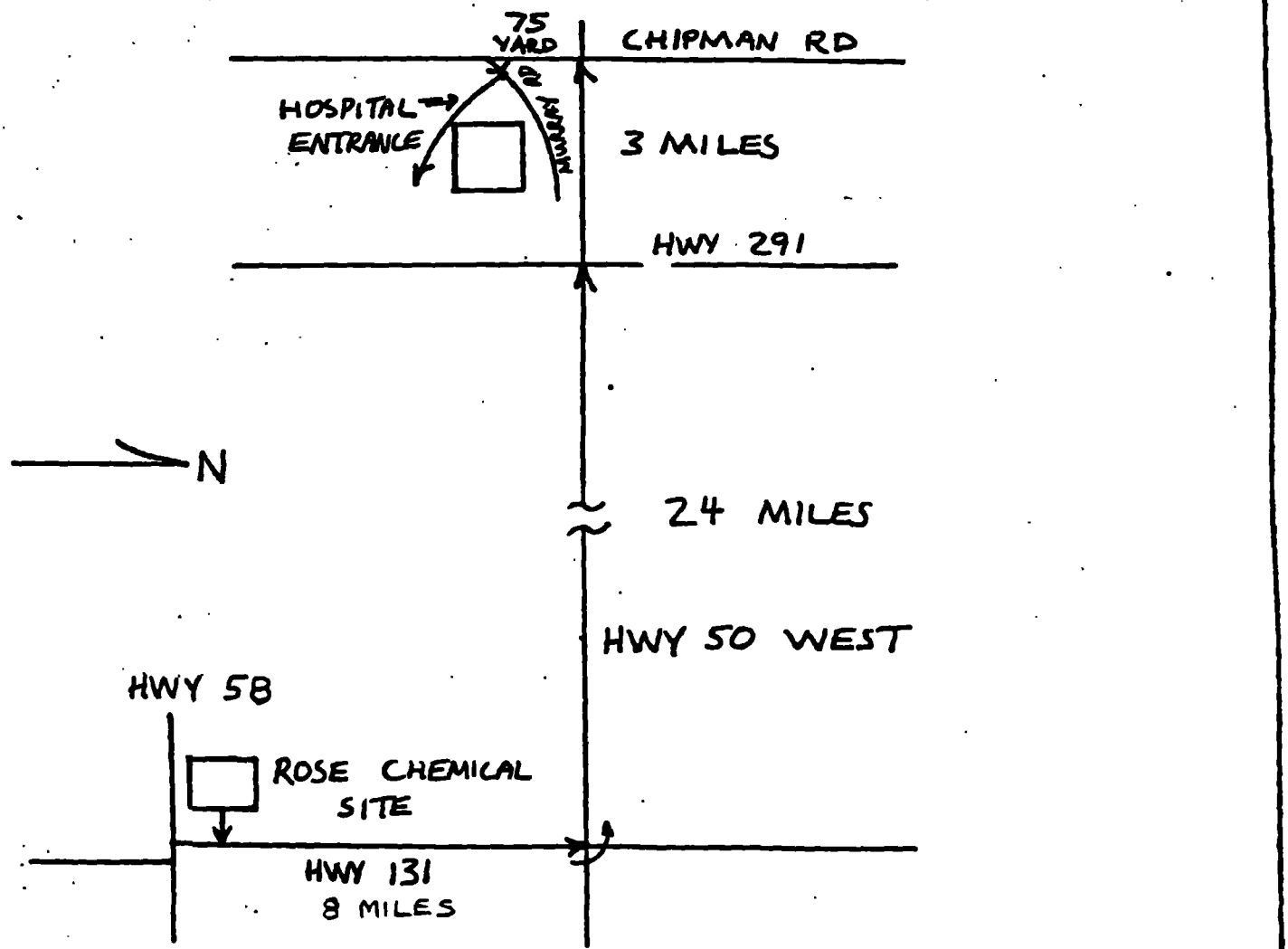
SAFETY PLAN ADDENDUM

NUMBER: 001

PREPARED BY: JAMES WALLWORK DATE: 12/5/86

CREW BRIEFING CONDUCTED BY: J. WALLWORK DATE: 12/8/86

DESCRIPTION: MAP OF ROUTE FROM SITE TO HOSPITAL



APPROVALS:

PROJECT MANAGER: _____ SAFETY OFFICER: _____

ON SITE COORDINATOR: _____ OTHERS: _____

APPENDIX C

SAFETY PLAN ADDENDUM

NUMBER: 002

PREPARED BY: JAMES WALLWORK DATE: 12/5/86

CREW BRIEFING CONDUCTED BY: J. WALLWORK DATE: 12/8/86

DESCRIPTION: DIRECTIONS TO HOSPITAL

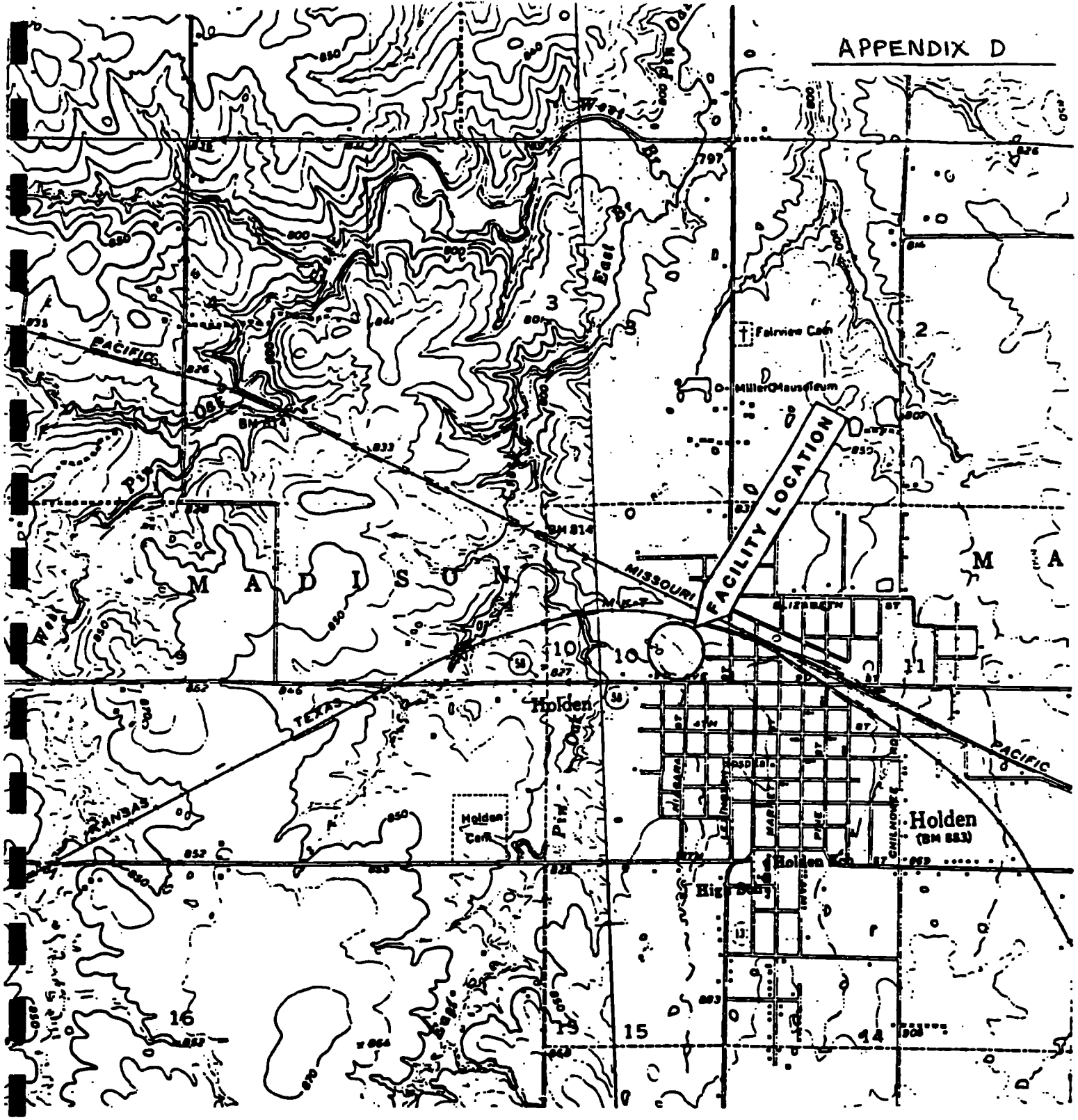
HEAD EAST DOWN McKISSOCK ST AND
TURN LEFT ON HIGHWAY 131.
FOLLOW HWY 131 TO HWY 50.
TURN LEFT ONTO HWY 50 WEST.
STAY ON HWY 50 WEST FOR 27 MILES THEN
EXIT HIGHWAY 50 AT CHAPMAN ROAD EXIT
TURN LEFT ONTO CHIPMAN ROAD SOUTH.
TAKE CHIPMAN ROAD SOUTH FOR 75 YARDS
THEN TURN LEFT ONTO MURRAY ROAD.
THE EMERGENCY ENTRANCE ON THE LEFT.
TOTAL DISTANCE IS 35 MILES AND
DRIVING TIME IS 40 MINUTES.

APPROVALS:

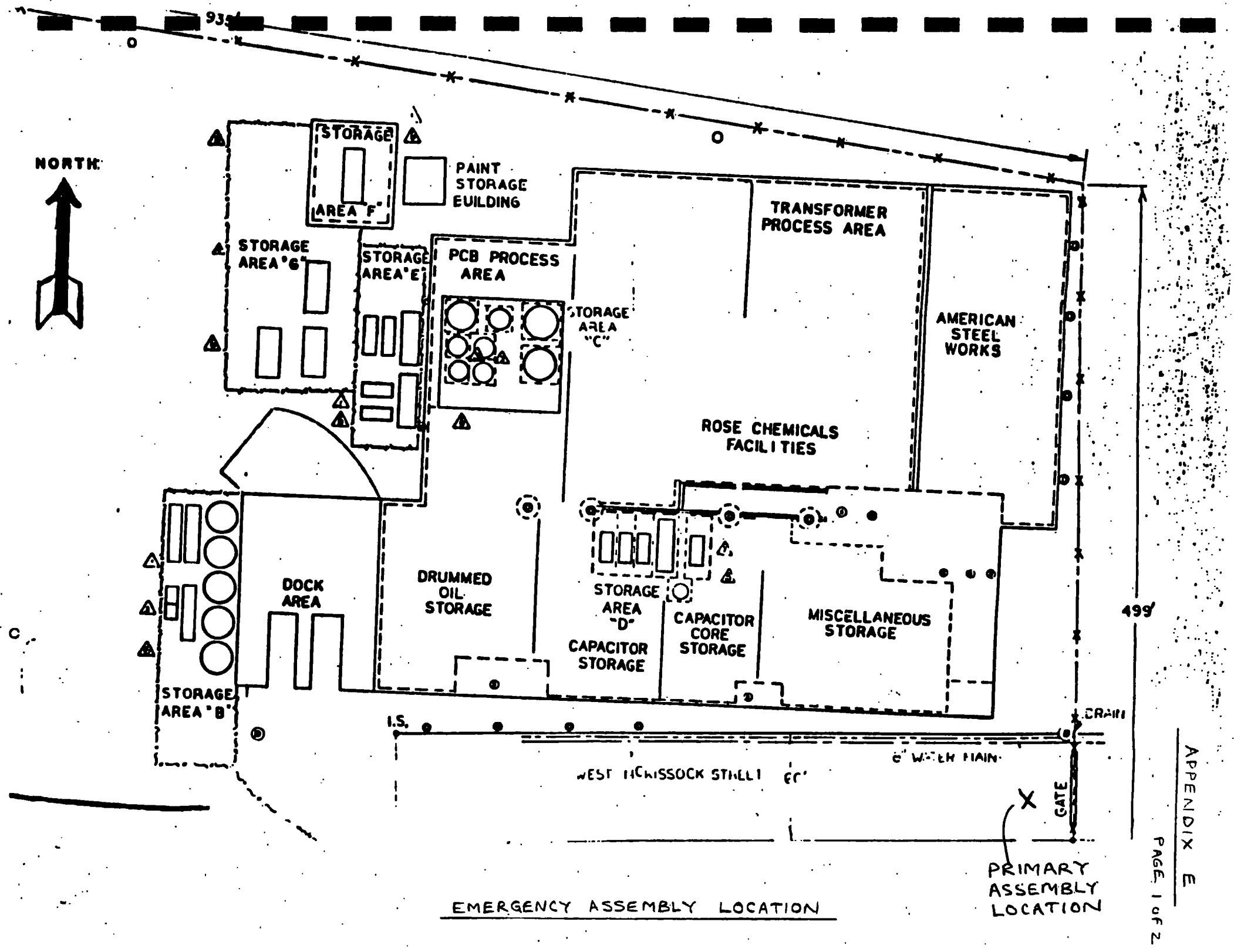
PROJECT MANAGER: _____ SAFETY OFFICER: _____

ON SITE COORDINATOR: _____ OTHERS: _____

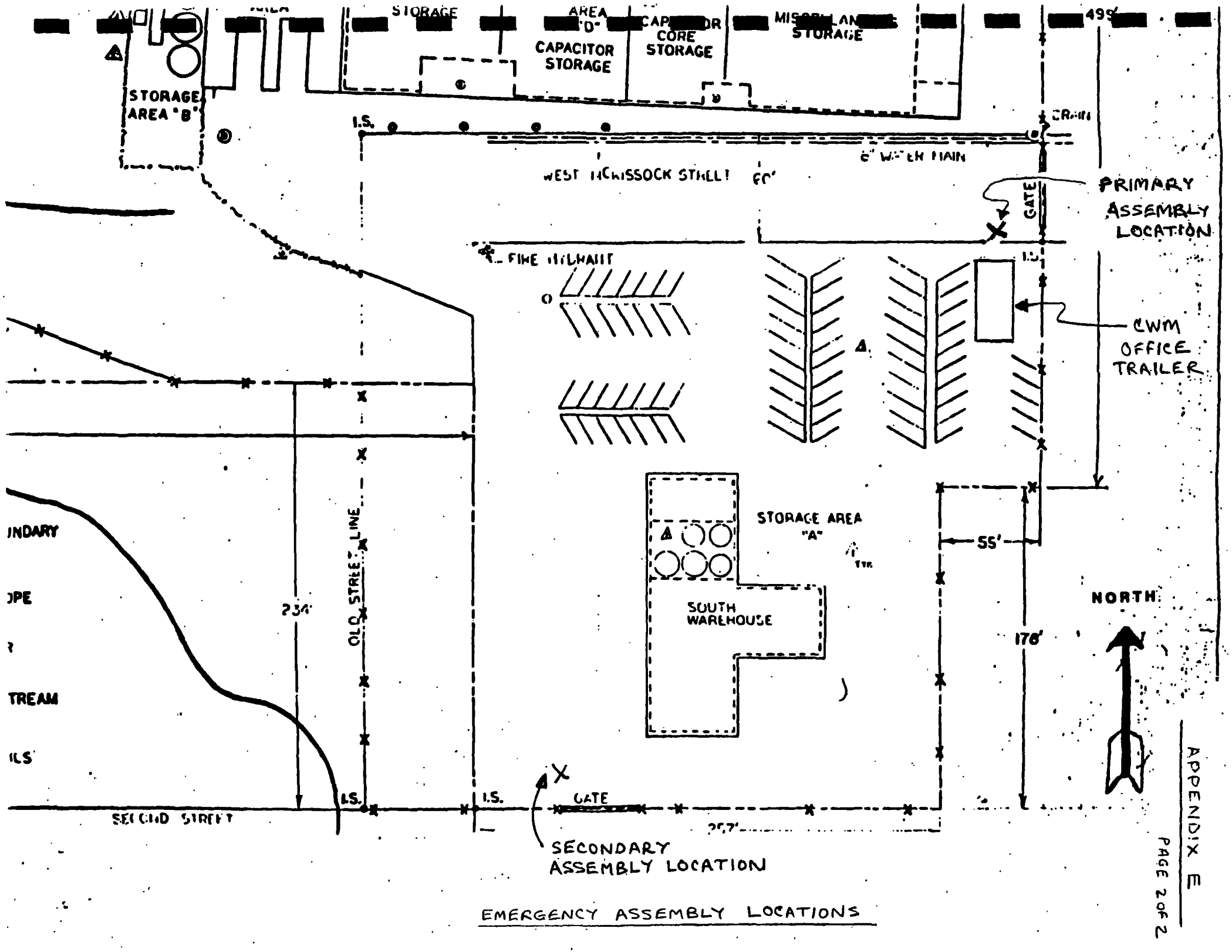
APPENDIX D



ROSE CHEMICAL
HOLDEN MO.



EMERGENCY ASSEMBLY LOCATION



EMERGENCY ASSEMBLY LOCATIONS

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT

SCHENECTADY, N. Y. 12305

Phone: (518) 385-4085 DIAL COM: 8*235-4085

MATERIALS INFORMATION SERVICES

NO. 1200

AROCLOR 1254

Date May 1980

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: AROCLOR 1254

DESCRIPTION: Distillation cut of polychlorinated biphenyl (or diphenyl), containing 54% Cl.

OTHER DESIGNATIONS: PCB, an Askarel, PYRANOL, GE Material A13B1, CAS # 027 323 188

MANUFACTURER: Material was a product of Monsanto Co., but dropped in 1977. Except for uses specifically exempted and regulated by EPA (for example power transformers), legal manufacture, distribution in commerce, and use of PCB's in USA ended in 1979 under TSCA.

SECTION II. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
Mixture of Chlorinated Biphenyls, $C_{12}H_{10-x}Cl_x$:	ca 100	EPA exemption or authorization needed for any measurable exposure*
		Rat, Oral LD_{50} Adult 4-10 g/kg Weaning 1.2 g/kg
		Rat, Intravenous LD_{50} 358 mg/kg
		Rat, Oral, TDLo 1220 mg/kg/35 wk (neoplastic effect)

x	Approx. %
2	0.5
3	1
4	21
5	48
6	23
7	6

Includes 69 or more compounds with average of 4.98 Cl atom/molecule. Mixture may contain 0-2 ppm chlorinated dibenzofurans.

*Current ACGIH 8-hr TWA is 0.5 mg/m^3. NIOSH has proposed a 10-hr TWA of 1.0 µg/m^3. Materials with over 50 ppm PCB content are regulated for handling, storage, records, and waste disposal. EPA criterion in navigable waters is 0.001 µg/l. PCB's.

SECTION III. PHYSICAL DATA

Boiling range at 1 atm, deg C	ca 360-390	Specific gravity (65/15.5 C)	1.5
Vapor pressure at 150 C, mm Hg	<1	Pour point, deg C	10
Water solubility at 25 C, ppm	ca 0.01	Molecular weight (Av)	327
Viscosity at 100 F, cstk	ca 460	Partition Coef. (octanol/water)	$>10^4$

Appearance & Odor: A light yellow, viscous fluid.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
None to boiling point				

Extinguishing Media: Use media appropriate to the surrounding fire conditions. This material has very low combustibility, but it can undergo thermal-oxidative degradation in a fire situation.

Firefighters should use full protective clothing and self-contained breathing equipment when fighting fire where any PCB's are involved.

SECTION V. REACTIVITY DATA

AROCLOR 1254 and other PCB's are nearly inert materials with very high chemical stability; the higher chlorine levels usually give the greater stability. At about 300 to 600 C some PCB's can oxidize to produce chlorinated dibenzofurans which are much greater in toxicity than the PCB's. For complete incineration of PCB's a 2-second dwell time above 2000 F (1090 C) with 3% excess oxygen in the stack is suitable (see Sect. VII).

AROCLOR 1254 shows very little degradation after 3 weeks exposure to direct sunlight.

PCB's are strongly absorbed on particulates or sediments in aquatic systems (streams, lakes, ocean, etc.).

Mixed in activated sludge, biodegradation occurs slowly, but only very slowly or almost not at all with compounds above Cl_4.

GENERAL ELECTRIC

No. 1200

SECTION VI. HEALTH HAZARD INFORMATION

TLV (See Sect. II)

PCBs show high levels of bioaccumulation in fatty tissue and very slow metabolism, especially for Cl_5 compounds and above. They have become widely dispersed in world-wide environment and in the food chain (much like DDT) since their introduction in 1929. Effective control of PCB discharge into the environment began after 1970.

AROCLOR 1254 has a low vapor pressure, but it can be irritating to the eyes, nose, and throat if misted or heated to produce vapors. Excessive acute and chronic exposures may cause liver damage. Chronic exposure to or ingestion of PCB's (especially when thermally oxidized) can result in chloracne after 1-6 months. There is some evidence of possible carcinogenic risk and adverse reproductive effects with this material. PCB may appear in the breast milk of an exposed mother.

FIRST AID:

Skin Contact: Clean exposed skin with waterless cleaner, wipe with a disposable towel then wash with soap and water. Promply remove contaminated clothing. (Control separate disposal of PCB-contaminated materials.)

Eye Contact: Flush promptly & thoroughly with lots of running water for 15 minutes.

Inhalation: Remove to fresh air. Get medical help if symptoms continue.

Ingestion: Get medical help. NIOSH has recommended that vomiting be induced.

Get medical help in all cases of severe exposure, repeated exposures, or persistent symptoms.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Notify safety personnel of all PCB spills or leaks. Promptly contain spilled material! Prevent its release into the environment! Restrict PCB spill area to trained clean-up personnel; use proper protective gear; follow an established emergency plan.

Stop leakage if possible. Pick up spill. Absorb small spills and residues using a powdered, dry clay. Place leaking containers, picked-up PCBs, and PCB-contaminated materials and refuse into approved, properly labeled, closed containers for storage under controlled, EPA regulated conditions prior to disposal. EPA allows approved storage to 1/1/84.(See Sect.IX.) Storage: 40CFR761.42; Annual report: 40CFR761.45

DISPOSAL: Destroy PCB-containing material by burning in an EPA approved facility. Liquid 50-500 ppm PCB material can be burned as above or landfilled if not ignitable. Non-flowing, PCB-contaminated debris can be disposed of in an EPA approved landfill. (See 40CFR 761; Federal Register, Vol. 44, 31551-4, 66989; Vol.45, 20473.)

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide highly effective local exhaust ventilation (trap for exhaust vapors) especially if this material is heated or misted. Unless authorized by EPA an isolated system must be used for PCBs.

For nonroutine and emergency conditions of exposure use an approved canister respirator or self-contained breathing equipment.

Prevent skin contact for those who work with PCBs. Use neoprene or polyethylene gloves and apron, safety glasses and/or face shield, and other protective clothing as determined by use conditions. An eyewash station and washing facilities should be available to the work area.

Provide for special handling and disposal of PCB-contaminated materials, including paper towels and clothing (see Sect. VII). Provide locker and shower facilities. Workers must be trained for PCB work, and they must follow good hygienic practice.

Provide pre-placement medical exams for workers with emphasis on liver function, skin condition, and reproductive history. Provide annual medical exams for exposed workers.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

PCB-materials in containers and in equipment must have proper labeling including the date of storage. Short term (up to 30 days) storage of non-leaking PCBs can be done. Long term storage requires an EPA approved facility, including such criteria as roof and walls to shield from rain, impervious base and diking which will contain 25% of stored volume or twice the volume of the largest container, no drains or openings to allow flow loss, and the base must be located above the 100-year flood water elevation. Prevent physical damage to containers. Inspect storage frequently.

Prevent skin contact with PCBs, or with solid products contaminated with PCBs. Prevent inhalation of airborne PCBs. Properly contain PCBs until legally disposed of; do not allow them to escape into the environment!

PCBs, and especially used PCBs, can contain higher toxicity contaminants.

DATA SOURCE(S) CODE: 1-6,20,26,31,36

APPROVALS: MIS CRD J.M. Kilen

Industrial Hygiene and Safety

MEDICAL REVIEW: June 1980

GENERAL ELECTRIC

1.0 INTRODUCTION

This SPCC plan has been prepared in accordance with 40CFR 112.7, for the Martha C. Rose Chemicals Company site, located at 500 West McKissock, in Holden, Missouri 64040 (site maps are included as Attachments 1 and 2). This plan is required because the above ground storage capacity of oils in this facility exceeds 1,320 gallons. This plan specifically elaborates on practices, procedures, structures, and equipment at the site which prevent the likelihood of spills, and if a spill is discovered, the steps taken to mitigate any impact on the environment or human health.

2.0 GENERAL

For this SPCC plan, the following types of storage containers exist:

1. Outside bulk storage tanks.
2. Inside bulk storage tanks.
3. 55 gallon drums.
4. Transformers and capacitors.

Each of these containers will be discussed in subsequent sections (Attachment 3).

3.0 STORAGE CONTAINER DESCRIPTION

3.1 Bulk Storage Tanks

Located on the western edge of the building are 28 storage tanks including two tank-trailers. To the north of the building is one tank. All of these tanks are located within clay berms. Any drains that have been installed in these berms have been

closed off. The height of the berms are adequate to contain the liquid of the largest tank.

3.2 Inside Bulk Storage Tanks

Located in the main storage building are 22 storage tanks. Located in the south warehouse are 5 storage tanks. All of these tanks are within a concreted area complete with floor and curbing. The current condition of the curbing is not adequate to contain the maximum volume of liquid in the largest tank due to cracks and deterioration of the curbing. This will be repaired during Phase I. Any drains that have been installed in these areas have been closed off.

3.3 55 Gallon Drums

All 55 gallon drums are stored within the two storage warehouses. There are approximately 7,500 drums of assorted material. It is assumed that all 17E (closed head) drums are filled with PCB liquids. The 17 C or H (open head) drums may be filled with liquids and/or solids.

Both buildings have concrete floors and inside curbing to contain spillage. Aisle space was greatly increased during the crate and drum inventory. At that time, all drums were inspected for leakage. The drums, as well as the tanks are inspected daily for signs of leakage.

3.4 Transformers and Capacitors

Numerous transformers were stored throughout the main warehouse. Once inventoried, the capacitors were staged in common areas.

4.0 SPILL PREVENTION, CONTROL AND COUNTERMEASURES

4.1 Potential Spill Areas

Any of the areas discussed in Section 3 have the potential for leakage. The subsequent discussion covers the most likely problem areas and the steps taken to remediate those problems.

4.2 Outside Bulk Storage Tanks

To establish early detection of potential problem areas, a daily walk-around inspection during working hours will be conducted to visually determine that tanks are not leaking. During non-working hours, the site security guards are required to inspect the outside grounds every hour. In this case, if a leak is detected, the guard is equipped with the CWM-ENRAC emergency phone list. A weekly site inspection is done by CWM-ENRAC in conjunction with CSI for detection of leakage or failure of tank integrity. This is recorded and filed on site (Attachment 4).

If leakage is detected during working hours or after working hours, efforts will be made to stop the leak. The contents of the tank will be removed via pumps and hoses and placed into a CWM-ENRAC on-site storage tank. The capacity of the storage tank is 20,000 gallons. If more than half of its volume is used in containing leaking tanks, a second storage tank will be brought in.

4.3 Inside Bulk Storage Tanks

The same procedures delineated in Section 4.2 will apply to the inside tanks. However, during non-working hours, the security guards are not trained and permitted for inter-building inspections.

4.4 55 Gallon Drums

All drums will be included in the daily and weekly inspection. If a leak is detected, the leaking drum will either be placed into an 85 gallon overpack drum or the contents of the leaking drum will be transferred into another 55 gallon drum. The leak will be cleaned using absorbents such as an oil dri material.

4.5 Transformers and Capacitors

All transformers and capacitors will be included in the daily and weekly inspection. If a leak is detected, it will be stopped and the spilled material pumped into drums or absorbed with oil dri and placed in drums.

4.6 Spill Prevention and Control Equipment/Materials

The following items will be maintained on-site for spill prevention and control purposes:

1. 20,000 gallon portable storage tank.
2. Rubber tired backhoe.
3. Hand tools, e.g., shovels, rakes, etc.
4. 50 steel 85 gallon drums.
5. 50 steel 55 gallon drums.
6. 100 bags of ground clay absorbent (oil dri).
7. 50 feet absorbent boom.
8. 4 bales of absorbent pads.
9. Necessary protective equipment for employees.
10. Necessary pumps and hoses for transferring liquids.

4.7 General

Adequate containment and/or diversionary structures or equipment to prevent discharged substances from reaching a navigable water course is provided. The containment as provided by concrete or clay floors, curbs and walls was described in Section 3.0 for each respective unit. In addition, sorbent materials, hand tools and excavating equipment are available to divert, retain or construct a barrier against migration of any spilled materials.

5.0 PERSONNEL TRAINING AND SPILL PREVENTION PROCEDURES

All site personnel undergo a thorough training program dealing with hazardous materials, personnel protection, and general operating procedures before they are allowed to work.

Supplementary training is provided prior to a new task being undertaken. Integral parts of the personnel training are Spill Prevention and Emergency Response.

Daily safety meetings are used to convey any new or changed procedures. Potential problem areas are discussed in detail until all employees understand the appropriate procedure.

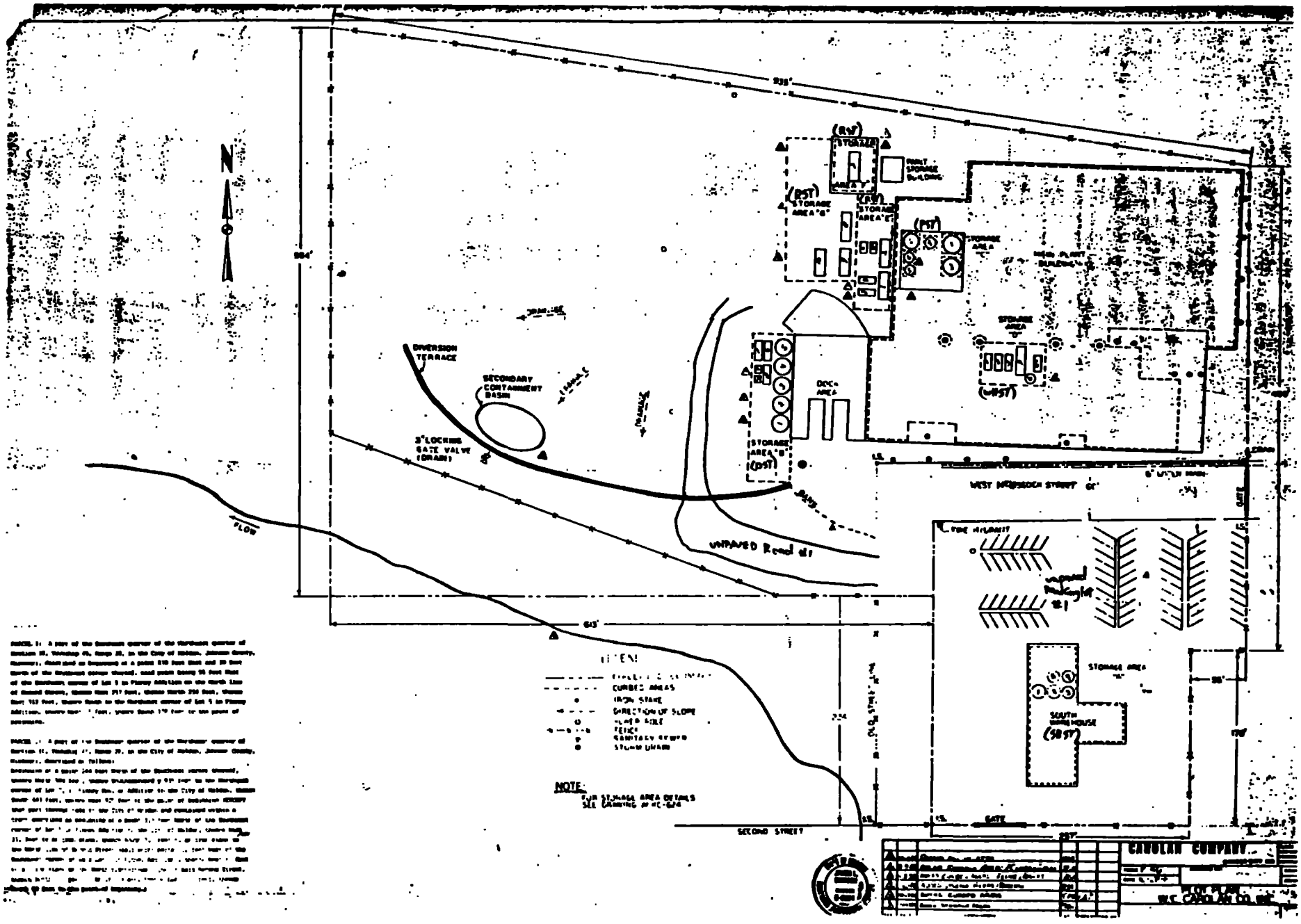
All site personnel are responsible for Spill Prevention.

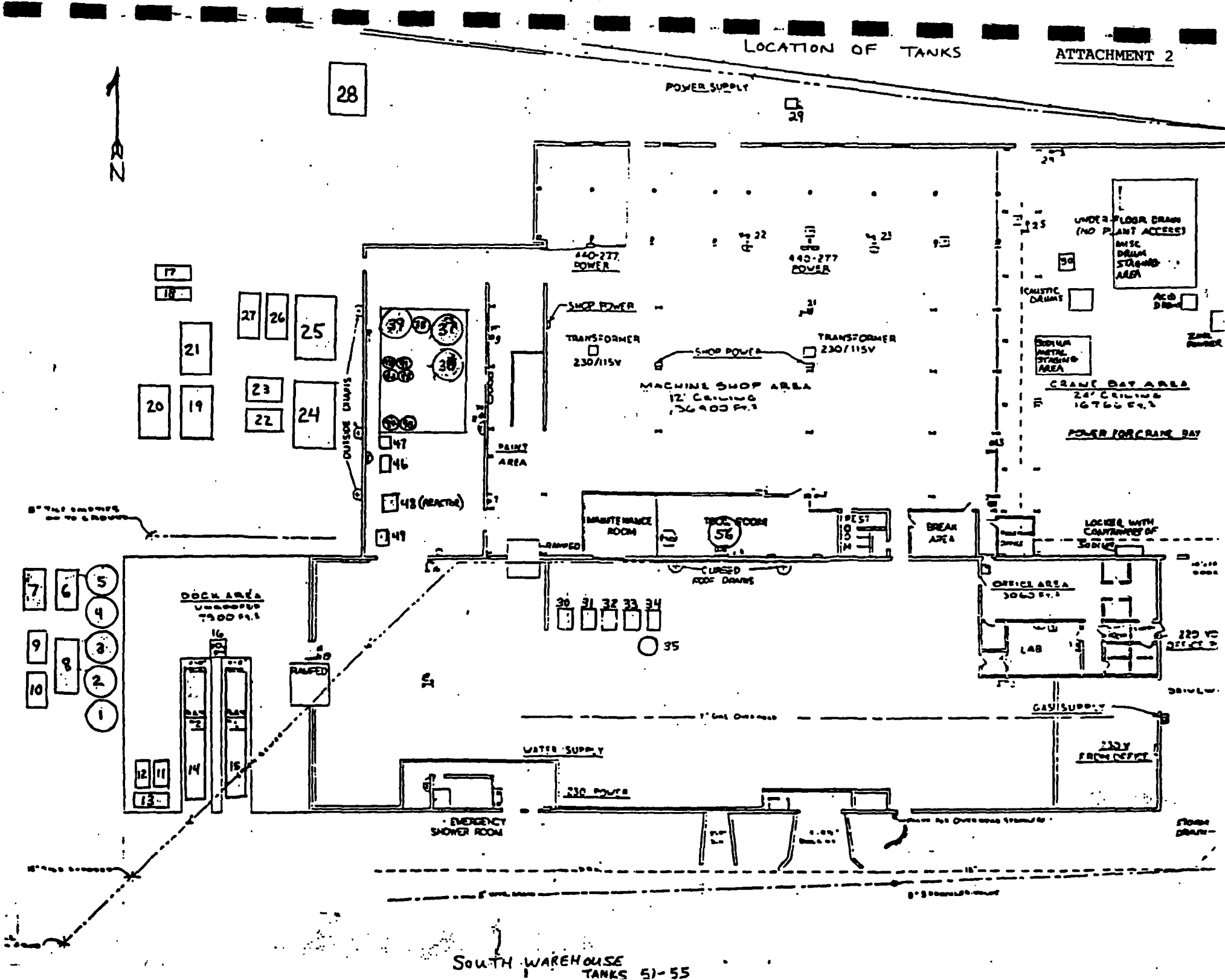
6.0 SPILL RESPONSE

This plan has described in detail the steps and the measures taken to prevent a spill. Also described is the equipment available to control a spill. In the event of a spill or other emergency which may or may not be associated with a spill, appropriate steps by safety, control, response and notification

are given in the USEPA developed Emergency Contingency Plan for the Martha Rose Chemical. All site personnel are made familiar with this site contingency plan.

ATTACHMENT 1




LOCATION OF TANKS
ATTACHMENT 2
N
28
POWER SUPPLY
29
440-277 POWER
SHOP POWER
TRANSFORMER 230/115V
MACHINE SHOP AREA
12' CEILING
CRANE BAY AREA
24' CEILING
POWER FOR CRANE BAY
UNDER FLOOR DRAIN (NO PLANT ACCESS)
CAUSTIC DRUMS
ACID DRUMS
SODIUM METAL STORAGE AREA
ZINC POWDER
OUTSIDE DRUMS
PAINT AREA
48 (REACTOR)
MAINTENANCE ROOM
TOOL ROOM
56
PEST
BREAK AREA
LOCKER WITH CONTAINMENT OF SODIUM
CURBED ROOF DRAINS
OFFICE AREA
LAB
DOCK AREA
RAMPED
GAS SUPPLY
WATER SUPPLY
230 POWER
EMERGENCY SHOWER ROOM
STORM DRAIN
SOUTH WAREHOUSE
TANKS 51-55

ATTACHMENT 4

WEEKLY INSPECTION

Date _____

Inspector _____

OUTSIDE TANKS	SATISFACTORY	UNSATISFACTORY*
1. Condition of tanks		
2. Apparent leaks		
3. Absence of water in berms		
4. Condition of berms		
5. Drains closed		

INSIDE TANKS		
1. Condition of tanks		
2. Apparent leaks		
3. Absence of water in berms		
4. Condition of berms		
5. Drains closed		

DRUM STORAGE AREA		
1. Adequate aisle space		
2. Housekeeping		
3. Safety of stacks		
4. Leaks		
5. Signs of deterioration		

CRATE STORAGE AREA		
1. Adequate aisle space		
2. Housekeeping		
3. Leaks		
4. Signs of deterioration		

TRANSFORMER STORAGE AREA		
1. Adequate aisle space		
2. Housekeeping		
3. Leaks		
4. Signs of deterioration		

SPILL RESPONSE EQUIPMENT		
1. Backhoe		
2. Drums (55 & 85)		
3. Absorbents (bulk, boom, pads)		
4. Hand tools		
5. Transfer equipment (pumps, hoses, etc.)		

* Any unsatisfactory requires and explanation and location.

APPENDIX A

PROCEDURE:	Security	DATE:	3/1/84
SEGMENT:	Emergency Response	INDEX:	BE-2001
TOPIC:	Emergency Contacts	PAGE:	3

EMERGENCY CONTACT LIST

PROJECT: MARTHA C. ROSE CHEMICALS

EMERGENCY CONTACT	PHONE NUMBER
POLICE	816/732-5527/5528
FIRE	816/732-5527/5528
ENRAC	816/732-4334
ENRAC CONTACTS	PHONE NUMBER
PROJECT MGR.: Mark Henke	816/429-2183
PROJECT COORD.: J. Dearman	816/429-2183
SAFETY COORD.: J. Wallwork	816/429-2183
TEAM LEADER: Kevin Staton	816/429-2183
TEAM LEADER: Jerry Cross	816/429-2183
PROJECT MANAGER CLEAN SITES	PHONE NUMBER
C. KLINE	SITE: 816/732-5520 Lee's Summit, MO: 816/524-6260 Lake Jackson, TX: 409/299-1147
J. Hollingsworth	816/747-8744
HOSPITAL	816/525-2950
RESEARCH EAGLE 1 Helicopter	800/637-4300
LIFLIGHT 2 Helicopters	816/942-4400

PROJECT SCHEDULE

ROSE CHEMICALS SITE

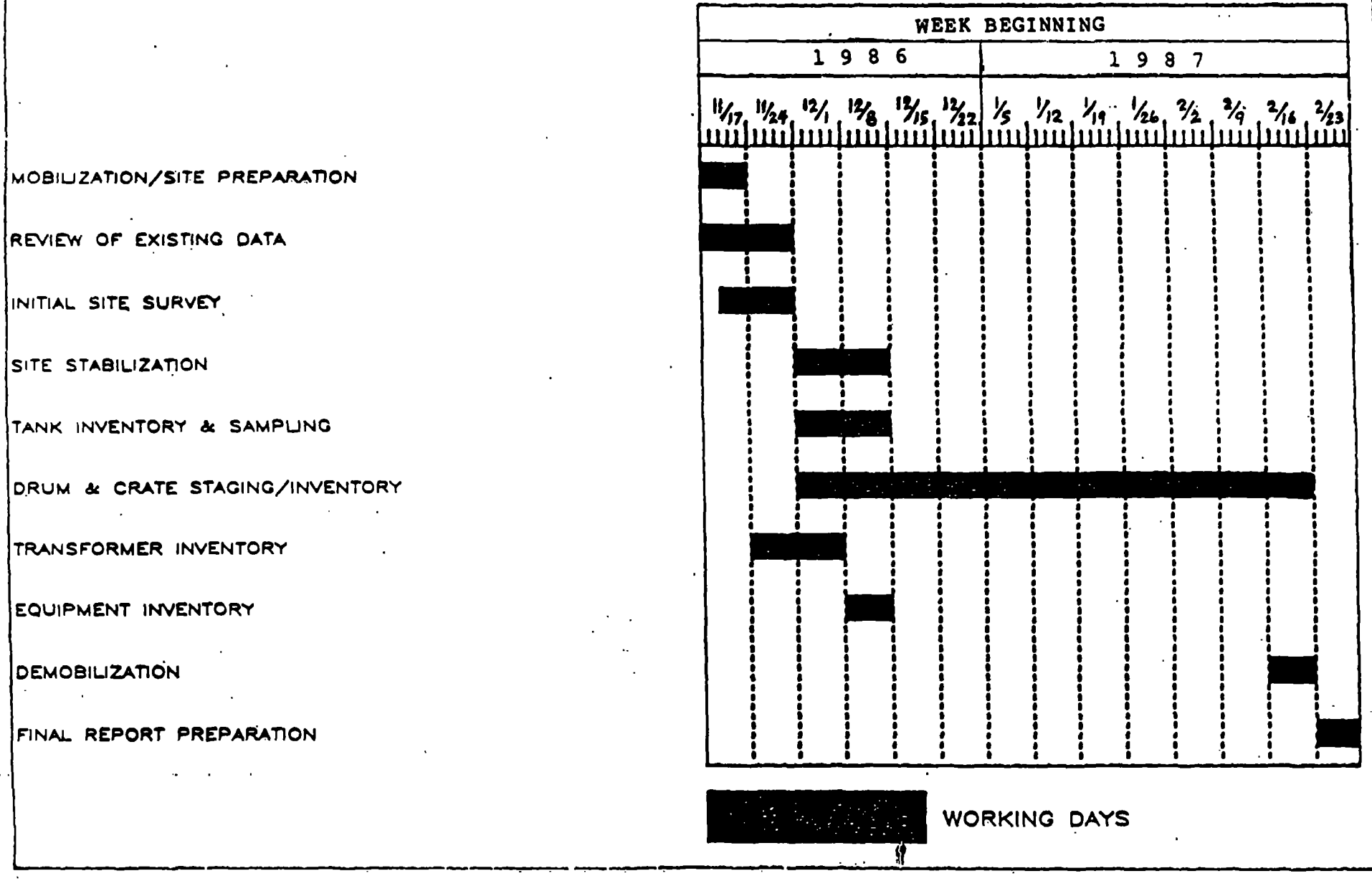
PHASE 1

CLEAN SITES, INC.

ALEXANDRIA, VIRGINIA

REVISED 2-12-87

ROSE CHEMICALS SITE CLEANUP
WORK SCHEDULE



DRAFT

INVENTORY PLAN

ROSE CHEMICALS SITE

PHASE 1

CLEAN SITES, INC.

ALEXANDRIA, VIRGINIA

REVISED 2-12-87

ROSE CHEMICALS SITE

PHASE I

INVENTORY PLAN

INDEX

SECTION

No spot checking to go back and see if data is being inputs
i.e. Randomly select 10 drums etc and redo inventory to test activity.

ROSE CHEMICALS SITE

PHASE 1

INVENTORY PLAN

1.0 *DESCRIPTION OF INVENTORY CONTROL SYSTEM*

One of the primary tasks of the Phase 1 work being done at the Rose Chemicals site is to provide an inventory of the materials stored in the two buildings located on this site. A new electronics data input system is being used to collect data that is then stored in an IBM computer system using standard computer hardware interfacing equipment. The computer software utilizes a d-Base III Plus data base. Customized data print out reports can be generated to show the input data results in easily used formats. This system will provide the following:

- a comprehensive inventory of drums, crates, tanks, transformers, and pallets;
- volumes and weights of drums, crates and transformers;
- material contents of containers;
- data on the location of drums, crates and transformers prior to and after restaging keyed to a warehouse grid; and
- a means to easily retrieve data and produce comprehensive reports.
- best opportunity to determine original generator

2.0 TRANSFORMER INVENTORY SYSTEM

The transformer inventory was completed on December 23rd, 1986. Electronic data input equipment was not available at the site in December. The first phase of the transformer inventory was done manually by entering data on the Rose Chemical Transformer Inventory Control Form, Appendix A because the ~~elector~~ electronic data input system was not available. Each transformer was assigned a "T" number, such as T001, and this "T" number was spray painted on each transformer. All available information listed on the Transformer Inventory Control Form was read and entered on a

separate Inventory Control Form for each transformer. The information recorded on the form was then entered into the d-Base III Plus computer database. A report has been developed showing the following information:

- o Inventory number
- o Generator name
- o Manufacturer name
- o Serial no.
- o Maximum height, width and length
- o Calculated volume
- o Weight
- o Original location
- o Restaged location
- o Other data is entered under "Remarks" - Rose Number ?

A bar code number label will be placed on each transformer. This bar code number label will be referenced in the computer database to the "T" number previously assigned to each transformer. Each transformer will be weighed on a platform scale, if practical. The transformer weight and warehouse location will be entered into the hand held electronic data input unit and then stored in the computer under the new bar code label number along with all the information taken from each transformer during the first phase of the transformer inventory. A simplified flow diagram of the transformer inventory is shown in Appendix A of this Inventory Plan.

No attempt will be made during Phase I to determine if the transformer still contains oil. To do this safely and to avoid further PCB contamination, a well engineered and well-equipped area where transformers can be drained and flushed, and where PCB oil that may leak or spill can be collected, would be necessary.

Inspection for leak potential?

ROSE CHEMICALS SITE

PHASE 1

INVENTORY PLAN

3.0 WOODEN CRATE AND METAL BOX INVENTORY SYSTEM

The wooden crate and metal box inventory also was started before the hand held electronic data input equipment was available onsite. The inventory of these types of containers was done manually by entering data on the Rose Chemical Drum and Crate Inventory Control Form, Appendix B. Each crate or box was assigned a number, such a E001 and this number was spray painted on each box or crate. The inventory includes inspecting for material type, weighing crates or boxes, recording manifest numbers and reading labels for other pertinent data. All available information listed on the Drum and Crate Inventory Control Form was read and entered on a separate form for each box or crate. The information recorded on the form was then entered into the d-Base III plus computer data base.

Including Rose No.

A bar code number label will be placed on each crate or metal box. This bar code label number will be referenced in the computer data base to the "E" number previously assigned to each crate or box. When bar code number labels are placed on all the crates or metal boxes, the wooden crate and metal box inventory will be considered complete. A simplified flow diagram of the crate inventory system is shown in Appendix B.

An inventory report will be developed by generator code, restaged location, and sequential article number. The following information is available:

- Inventory number
- Generator name
- Material type
- Weight
- Number of labels
- Original "E" number
- Restaged location
- Shipping date
- Manifest number
- Rose No.

ROSE CHEMICALS SITE

PHASE 1

INVENTORY PLAN

4.0 DRUM INVENTORY SYSTEM

An inventory of all the drums stored in the Main Building that contain any type of material will be developed. This drum inventory is being done using the hand-held electronic data input equipment and preprinted bar code adhesive-backed labels, which are placed on each drum.

The procedure for this drum inventory is systematized. A clean work area is first set up to handle batches of approximately 40 drums. Pallets of drums are retrieved from a designated location in the warehouse and this location is entered into the hand held data input unit. The pallets containing the drums are moved to the work area. A bar code number label is placed on each drum and the number entered into the data input unit by scanning the label with a laser beam gun. This scan enters the drum number into the hand held input unit. Each drum is then weighed on a platform scale and the weight is entered into the hand held data input unit. The number of information labels is entered into the unit and all information for each label is read and entered also. This is usually generator name, date of shipping and manifest number. The drum is returned to the pallet and opened for inspection to determine the contents and how full it is. This information is also recorded in the hand held unit. Rose No on label or elsewhere on drum will also be recorded.

If the drum contains liquid, a sample is taken using a 6 mm. diameter glass tube and the sample is drained into a one-half pint glass sample bottle. A bar code label with a number identical to the bar code drum number is placed on the bottle and the sample bottle is stored for future use. The glass sample tube is discarded in a glass scrap drum.

The drums in pallets are returned to a location in the warehouse and this location is entered into the hand held unit as the restaged location. When space is available, like kinds of material are stored in a specific area for easier retrieval in the future.

If a drum contains soil, a small sample is scooped off the top level in the drum and placed in a sample bottle that has an identical bar code label number as that on the drum. The sample is stored for future use.

ROSE CHEMICALS SITE

PHASE 1

INVENTORY PLAN

All samples of liquids or soil takes from drums are stored in a secure sample storage area in the Main Building.

5.0 BULK STORAGE TANK INVENTORY

A bar code label number will be assigned and affixed to each bulk storage tank onsite including the tanks located in the South Warehouse. The following information will be entered into the hand held input data unit.

- o Article number
- o Type of container
- o Contents
- o Present location
- o Restaged area (if liquids transferred)
- o Volume of fluids in tank
- o Rose Chemicals tank number

A sample of the contents of the tank will be taken and an identical bar code label number as on the tank will be placed on the sample bottle. The sample will be stored in the sample area of the Main Building for future analysis. Sampling procedures are described in detail in the Phase 1 Sampling Plan.

In addition to the electronic data input, a Rose Chemical Tank Inventory Sheet (See Appendix C) will be filled out for each tank. This sheet will contain all the information entered electronically plus the following additional information.

- o The wall thickness of the storage tank.
- o Tank dimensions (needed to calculate tank volume).
- o Calculated empty weight of the tank.
- o Specific gravity of the liquid in the tank.

- o Any label or marking information on the tank.
- o General condition of the tank.
- o Does the tank have lifting lugs?
- o Does the tank have manways or access doors?

6.0 LOOSE CAPACITOR CORE INVENTORY

A large quantity of capacitor core material is stored in two locations in the Main Building. The "bag" room in the north central area of the building contains a very large pile of capacitor cores. The material is bagged in heavy walled paper bags. An estimate of the volume of core material in bags will be made. Using estimated volume and the weight/unit bag volume, a total weight of the core material can be calculated.

Loose capacitor cores are also stored in a large metal container that appears to be a bag filter house used for a large air handling system. The volume of this container will be determined from actual dimensional measurements and the weight of the cores stored there will be calculated.

The loose cores will not be repackaged in this Phase 1 work.

7.0 EQUIPMENT INVENTORY

The large pieces of PCB oil processing equipment and metal working equipment located throughout the Main Building will be inventoried. Each piece of equipment will receive a bar code label, and the dimensions will be recorded. Weight and volume of the equipment will be estimated. Any useful name plate information will also be entered into the inventory data base.

Wipe tests will not be done to ascertain the level of contamination of this equipment during Phase 1 work.

ROSE CHEMICALS SITE

PHASE 1

INVENTORY PLAN

8.0 MISCELLANEOUS MATERIAL INVENTORY

The following categories of miscellaneous material will not be inventoried with a bar code number, but information about each will be put into the inventory data base.

- o Empty Drums

  The number of empty drums stored in the South Warehouse building will be recorded. These empty drums will remain in this building.

- o Metal and Wood Trash and Debris

  The quantity of metal and wood debris scattered throughout the Main Building will be measured or estimated. Items such as pipe, electrical fixtures, metal plate, wood partitions, maintenance supplies, and office furniture are included in this category. Several piles of scrap ductwork, a small tank and a junked car in the field west of the building are also included in this category.

- o Wooden Pallets

  The quantity of wooden pallets used in the Main Building to store drums, crates, boxes, capacitors and transformers will be measured.

- o Scrap Wooden Pallets

  The quantity of scrap wooden pallets piled in the west dock area will be estimated.

9.0 QUALITY ASSURANCE/CONTROL OF INVENTORY SYSTEM

To provide assurance that the data taken on each drum, crate, tank and transformer is correct, a computerized report will be issued periodically for review by the CWM and CSI Project Managers. Data will be thoroughly checked and input errors corrected immediately. ? how ?

All samples taken will be marked with the discreet numbering system of the container from which the sample was taken. This will allow tracking of any samples and their analytical results back to their specific origin.

ROSE CHEMICALS SITE

PHASE 1

INVENTORY PLAN

A Chain-of-Custody record will be kept for each sample as shown in Appendix D attached.

All samples will be retained and stored on-site in the Main Building. Samples sent off-site for analysis will be returned with the results.

APPENDIX A

ROSE CHEMICAL
TRANSFORMER INVENTORY CONTROL FORM

Sampler Initials: _____

Original Location: _____

code here

Transformer Size: _____
dimensions

_____
KVA rating

Manufacturer: _____
Serial Number: _____
Weight(if shown): _____

Oil Capacity: _____ gallons ☐ Actual ☐ Estimated

Transformer Oil Level:
- ☐ Full
- ☐ 3/4 Full
- ☐ 1/2 Full
- ☐ 1/4 Full
- ☐ Empty
- ☐ Unknown

Labels: Number of Labels on Transformer _____

_____ generator	_____ date
_____ generator	_____ date
_____ generator	_____ date
_____ generator	_____ date

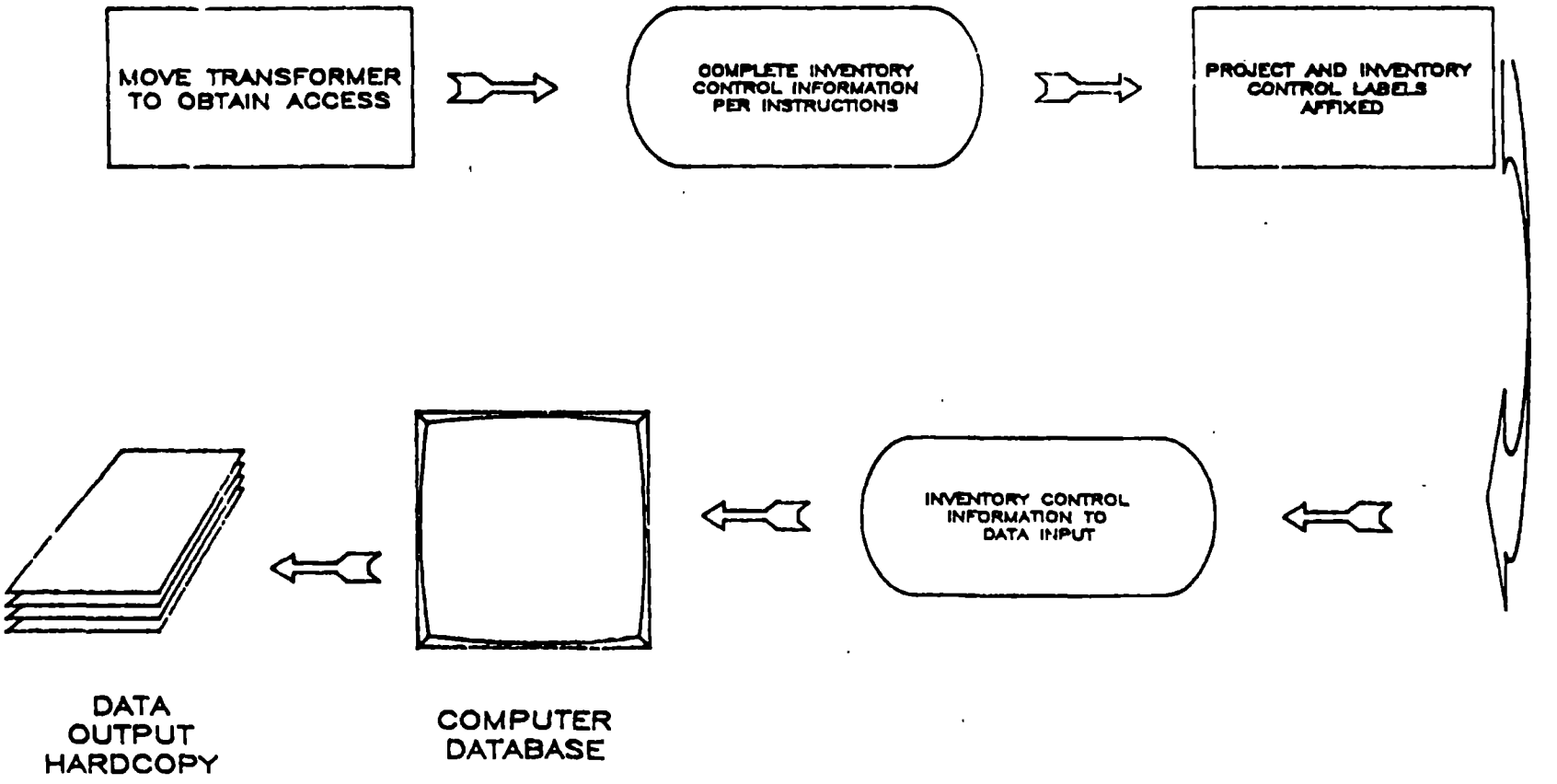
New Inventory Location: _____

Date: _____

Rose Number _____

Rose Number _____

ROSE CHEMICALS SITE
TRANSFORMER INVENTORY FLOW DIAGRAM



APPENDIX A

APPENDIX B

ROSE CHEMICAL
DRUM & CRATE INVENTORY CONTROL FORM

Sampler Initials: _____

Original Location: _____

Drum/Crate Size: (check one)
- ☐ 30 gal.
- ☐ 55 gal.
- ☐ 55 gal. overpacked
- ☐ Crate _____ (dimensions)
- ☐ Other _____ (explain)

Drum Type: (check one) ☐ Open Top ☐ Bung

Drum/Crate Contents: (check one)
- ☐ Liquid
- ☐ Cores
- ☐ Capicitor Parts
- ☐ Whole Capicitors
- ☐ Other _____ (explain)

Drum/Crate Level: (check one)
- ☐ Full
- ☐ 3/4 Full
- ☐ 1/2 Full
- ☐ 1/4 Full
- ☐ Empty

Labels: Number of Labels on Drum/Crate _____

_____ (generator)	_____ (date)
_____ (generator)	_____ (date)
_____ (generator)	_____ (date)
_____ (generator)	_____ (date)

Rose No. _____

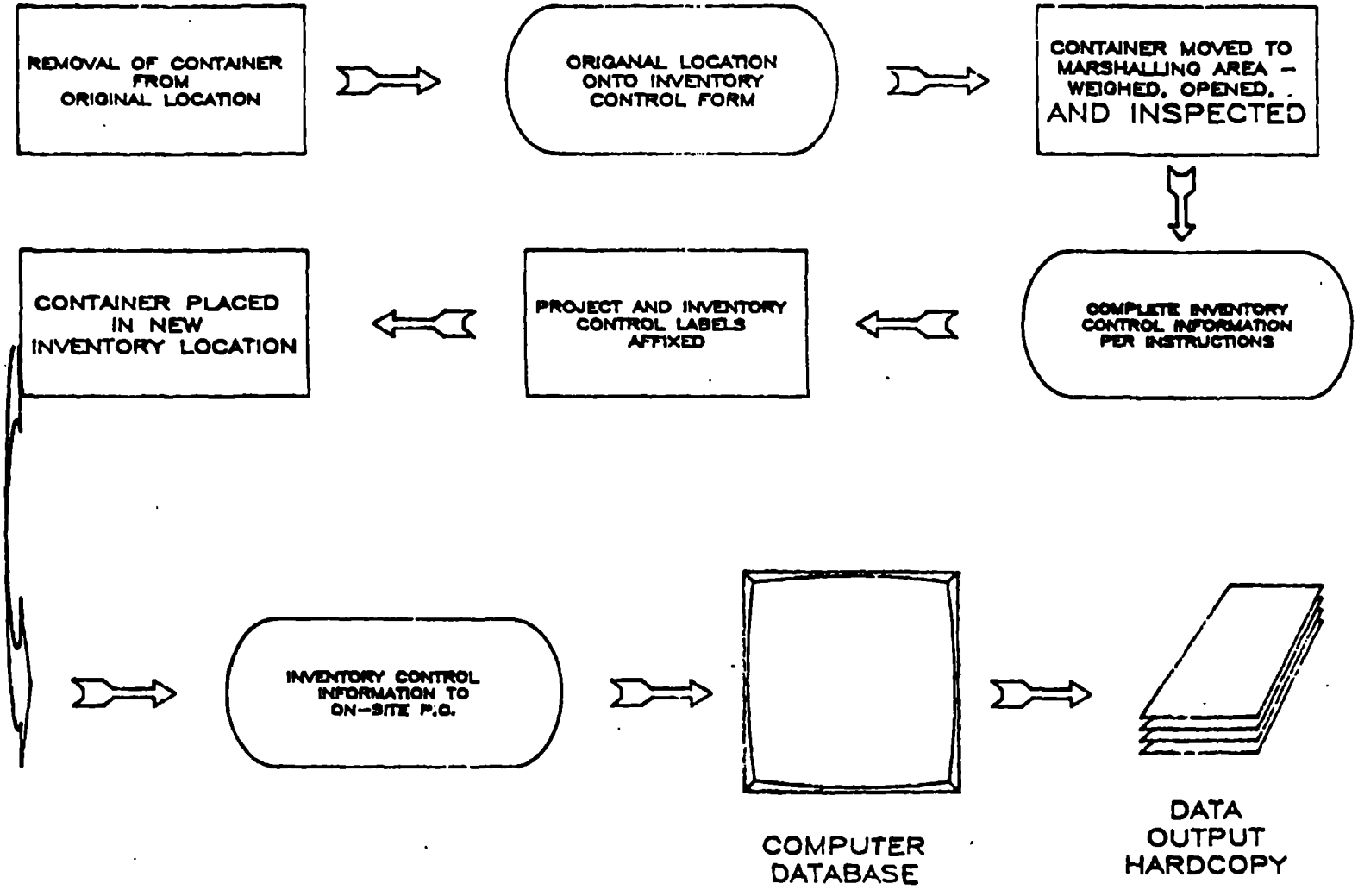
Rose No. _____

New Inventory Location: _____

Date: _____

weight stamped here

ROSE CHEMICALS SITE
DRUM AND CRATE INVENTORY FLOW DIAGRAM



APPENDIX B

ROSE CHEMICAL
TANK INVENTORY CONTROL FORM

Sampler Initials: _____

Tank Number: _____

code here

Tank Location: _____

General Condition of Tank: _____

_____

_____

_____

Access Ports: _____

_____

_____

Tank Size: _____
gallons

Tank Level-Actual: _____
gallons

Material Type:

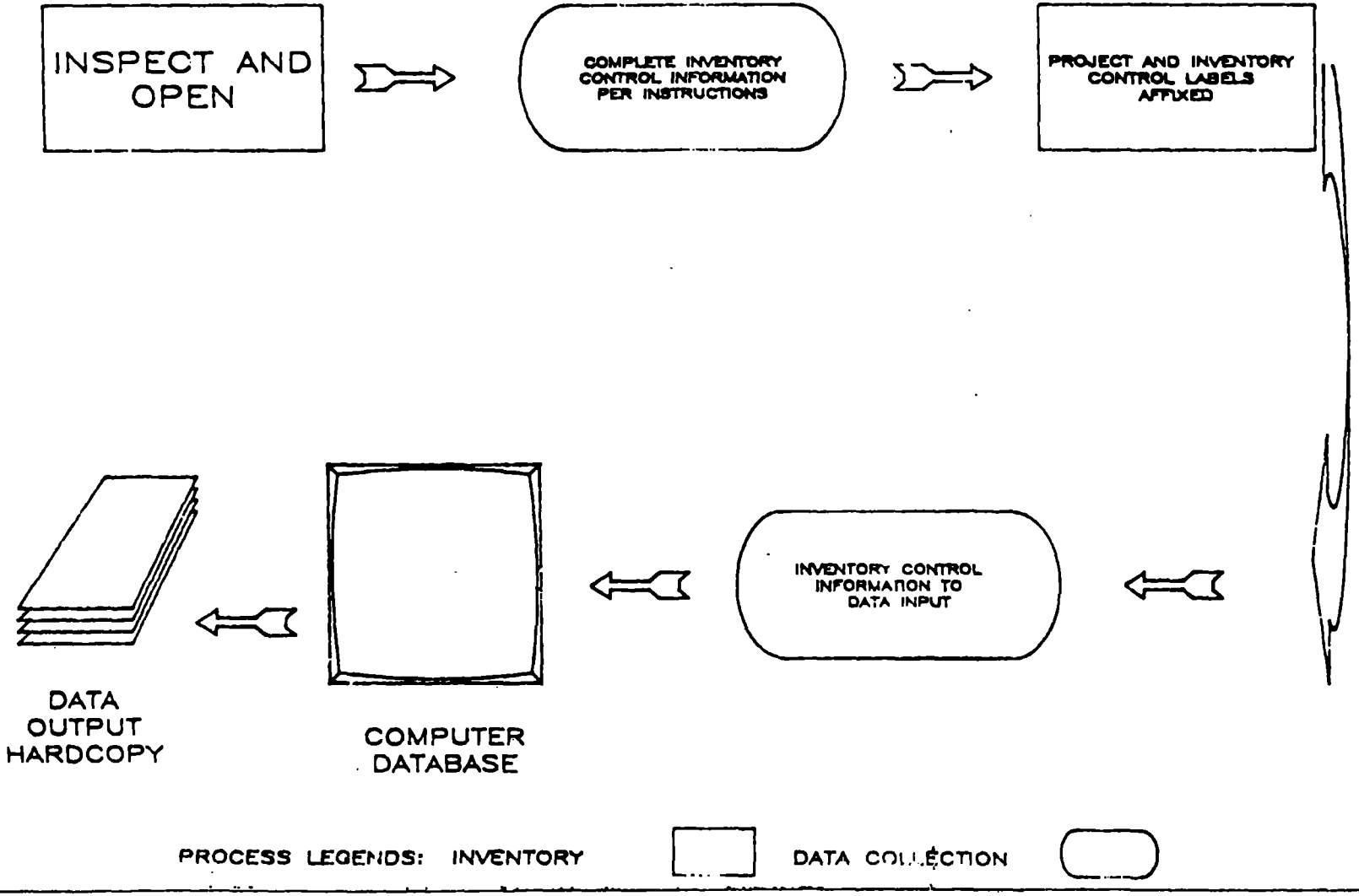
☐ **Liquid** _____
gallons

☐ **Sludge** _____
gallons

☐ **Solid** _____
gallons-converted

Date: _____

ROSE CHEMICALS SITE
TANK INVENTORY FLOW DIAGRAM



APPENDIX C

APPENDIX D

CHAIN OF CUSTODY RECORD
PCB Materials

Collector's Sample No. _____
_____
_____

Building Location of Sample: ____ I.D. Number: _____

____ Other: _____

Company's Name _____ Telephone ( ) _____

Address _____
number street city state zip

Collector's Name _____ Telephone ( ) _____

Date Sampled _____ Time Sampled _____ hours

Waste Type Code _____ Other _____

Sample Allocation:

1. _____
name of organization

2. _____
name of organization

Chain of Possession:

1.	signature	title	location	incl. dates
2.	signature	title	location	incl. dates
3.	signature	title	location	incl. dates
4.	signature	title	location	incl. dates
5.	signature	title	location	incl. dates
6.	signature	title	location	incl. dates
7.	signature	title	location	incl. dates

DRAFT

SAMPLING PLAN

ROSE CHEMICALS SITE

PHASE 1

CLEAN SITES, INC.

ALEXANDRIA, VIRGINIA

REVISED 2-12-87

ROSE CHEMICALS SITE

PHASE 1

SAMPLING PLAN

INDEX

SECTION

ROSE CHEMICALS SITE

PHASE 1

SAMPLING PLAN

1.0 INTRODUCTION

The Sampling Plan for Phase 1 of the Rose Chemicals Site cleanup addresses the methods and extent of the sampling to be performed for determining the levels of PCB contamination at the site.

Preliminary soil sampling at the site and analysis carried out in September and October, 1987, indicated very low levels of PCBs in the open areas and around the perimeter of the site. Levels above 10 ppm were found in only a few localized areas, particularly around the South Warehouse building. In this sampling and analysis activity, emphasis was placed on evaluation of possible PCB contamination around the perimeter of the site. This was done because of the urgent need to install a fence to secure the site and to determine what level of protective gear was required to protect the workers from PCB contamination.

Sampling and analysis of surface soil in the open areas of the site was designed to provide information regarding any possible exposure to workers during mowing of weeds and grass. Also, in these preliminary studies, some special attention was given to the sanitary sewer system/sewage plant, the creek into which site run-off flows, and evaluation of background levels of PCBs.

The Sampling Plan for Phase I will provide sampling and analysis of surface soil for the entire site. In addition, water samples will be taken from the "pit" inside the Main Building and from the storm water retention and spill containment ponds. Samples of liquids contained in drums and tanks and soils in drums will be taken.

ROSE CHEMICALS SITE

PHASE 1

SAMPLING PLAN

2.0 SAMPLING AREAS OF CONCERN

Following are listed five areas of concern relating to the site which can be monitored and controlled by sampling. The actions either already taken or planned to be taken to resolve the concern, are described below:

(a) Liquids in the "Pit" (Main Building)

Although the "pit" had been pumped dry in September, 1986, the high water table at the site resulted in the water returning. Oil appeared on the surface, and in January 1987, absorbent blankets were placed on the surface to absorb the oil. The blankets were then removed and placed in drums. Although most of the oil was absorbed, a minor amount of emulsified oil presently remains on the water surface. If more oil returns, the contractor will again remove the oil with absorbent blankets. A water sample has been taken from the pit and will be analyzed to determine the concentration of PCBs in the water.

oil sample ??

(b) Liquids in the Ponds

On September 3, 1986, during very heavy rains, the berm around the storm water containment pond southwest of the Main Building began to erode and a small stream of water made its way to the creek adjacent to the pond. O.H. Materials, the site stabilization contractor, was directed to reinforce the berm using a front end loader and to dig a small trench in the berm and install an inverted weir. The weir is a 6-inch pipe with the invert of the inlet installed about one foot below the surface of the pond and the outlet of the pipe placed outside the berm at a elevation to allow water to run through the pipe so that a constant level in the pond is maintained. No matter how much rain falls, the water in either of the ponds (the upper pond drains to the lower pond) will not overflow the berms. In theory, if any PCBs are present in the pond, they would settle to the bottom of the pond because of their weight and insolubility. Oil at the surface will not drain off because the inverted weir pipe inlet draws water from below the surface during periods of

heavy rain. Any noticeable oil sheen on the pond seems to disappear quickly as the wind forces the oil to the edge of the berm where it is deposited. Sampling analysis of the soil from the berms and sediment from the bottom of the ponds will be conducted as described in Section 4.0 of this Sampling Plan.

(c) Various "hot spots" already identified by sampling analysis and those to be identified in further sampling.

"Hot spots" identified by the sampling analysis completed to date are shown on the Site Plan - Appendix A. The procedure to be used for locating areas of high PCB concentration for the remainder of the site is also described in Surface Soil Sampling (Section 3.0). The area of high PCB contamination will be evaluated for the risk that the contamination could be carried offsite during heavy rains or high winds.

(d) Visible staining of work area(s) and the dock adjacent to the storage tanks.

All visible oil in the work areas(s) and the dock adjacent to the storage tanks will be cleaned up when a leak is discovered. When a leak is discovered, absorbent will be spread over the affected area and the residue cleaned up and properly containerized. Contents of any tank showing signs of leaking will be transferred to other non-leaking tanks onsite. Decontamination of any stained areas will be done when the Main Building is decontaminated after removal of all PCB contaminated material. Currently leaking tank due to expansion leak at top. ?

(e) Contaminated soils in the creek.

Only low levels of PCBs were detected by O.H. Materials in samples of surface sediment in the creek. Less than 2 ppm PCBs were found in the surface sediment. Soil cores taken at the outlet of the storm drain showed approximately 30 ppm PCBs at a depth of 0-6 inches and 2 ppm at the 6-12 inches level. Cores taken both upstream and downstream of this point showed concentrations of 1-2 ppm PCBs at the same depths. Further sampling is planned for the creek within the site property lines. The removal of PCB contaminated soils in the creek outside the Rose Chemicals site has not been considered. This should be considered and addressed

ROSE CHEMICAL SITE

PHASE 1

SAMPLING PLAN

3.0 SURFACE SOIL SAMPLING

In order to obtain representative samples of the surface soil uniformly over the area of the site outside the buildings to assess the level of PCB contamination, a systematic approach using a sampling grid has been selected. A grid plan which divides the area outside of the buildings into 50' X 50' sections is being used (See Appendix A). A composite sample consisting of 25 equal aliquots of surface soil has been or will be taken within each 50' X 50' section of the grid. Each aliquot is taken 10' apart and 5' from the edge of the grid square. This represents a 5 X 5 matrix within each grid square. The sample will be scooped to a depth of one-quarter to one-half inch (maximum of one inch) as described in the TSCA Inspection Manual, page 2-70. (See Appendix D).

After analysis, if any grid composite is found to contain more than 20 ppm PCBs, a smaller grid, e.g., 25' X 25', will be used to locate areas or spots within the larger grid where a specific spill might have occurred. This will divide the original grid into four squares having one-fourth of the original grid area. If a composite sample from one of these smaller squares is high in PCB's, that square will be subdivided again into four smaller squares. This sequence could be extended to smaller squares if necessary.

The above sampling scheme for the open areas using 50' X 50' grid sections will divide the site (exclusive of the building) into approximately 275 sections. In order to provide some information about the repeatability the extraction/gas chromatograph/electron capture detection procedure used in analyzing the samples, every 15th sample will be split and submitted to the laboratory as a blind duplicate. Therefore, the total number of samples from the grid sampling plan proposed for the open area of the site will be about 300.

4.0 SAMPLING AROUND THE PONDS

It is believed that oils containing PCBs had been diverted into at least one of the retaining ponds located southwest of the Main Building. In general, the ponds are downhill from the tanks located at the

west end of the building and any spilled material would tend to find its way into these ponds. Therefore, somewhat more extensive sampling around these ponds will be done.

Since oils containing PCBs tend to float on the surface of the water, they would be absorbed by the soil around the perimeter of the pond above and below the surface of the water. Contaminant distribution would be broad because of the rise and fall of water with alternate periods of rain and dry weather.

Nine samples will be taken for initial evaluation of possible contamination around the ponds.

- o Four samples taken about one foot from the waters edge (e.g., one each at the N, E, S, and W edges);
- o four samples of sediment (wet soil) taken under the water about one foot from the waters edge; and
- o one composite sediment sample taken from four spots near the center of each pond because there would be a tendency for any silt to carry adsorbed oils/PCBs to the bottom of the ponds.

o Sampling along drainage pond between upper pond and lower pond(s).

5.0 WATER SAMPLING ANALYSIS

o Sampling below outflow of bottom drain pipe.

For characterization of the site, one sample will be taken of the water from the effluent of the storm water retention pond, the spill containment pond, and the water standing within the berms surrounding the tanks at the back of the Main Building. Also a sample of the water in the "pit" in the Main Building will be taken and analyzed for PCB content. Water in the ponds will contain only small amounts of PCBs because of limited solubility. The soils around the ponds will probably contain the bulk of any contamination.

Analysis of any water draining from the ponds into the stream below the site would be of concern because of the possibility of contaminating the environment downstream of the site. The obvious spot where drainage occurs is at the pipe which drains the pond at the lowest elevation in the southwest corner of the site and a sample of the effluent will be taken as mentioned above.

2 samples of water from bottom drain pipe.

ROSE CHEMICALS SITE

PHASE 1

SAMPLING PLAN

6.0 SUB-SURFACE SAMPLING

No sub-surface sampling is planned during Phase 1. Surface sampling will identify the area of the PCB contamination and the depth of the sub-surface contamination will be determined during the next phase of the cleanup.
Time table.

7.0 AIR MONITORING

Any work activity inside the Main Building will stir up dust which could carry PCBs that should not be inhaled. In order to determine the health/safety risk from airborne sources, air sampling has been carried out during the inventory, sampling and restaging activities for Phase 1. Two fixed and one portable organic vapor analysis monitors are in use. Also two Dupont Alpha-one air samplers are used to determine the level of PCB concentration in the immediate operator work area.

The results of the air sampling analysis conducted to date by Langston Laboratories in Leawood, Kansas, show that the highest result has been 14.2% of the OSHA permissible exposure limit (PEL) for PCBs. The PEL is the legal limit a worker may be exposed to repeatedly without adverse effects. The locations of the fixed monitor samples are shown in the building sketch, Appendix B.
Results ? additional outside sampling at premises due to poor quality of data from OHM.

8.0 SAMPLING LIQUIDS

The following steps will be implemented for sampling liquids in drums and tanks throughout the Rose Chemicals site. Glass tubes will be used for the sampling of liquids in drums and sampling bombs will be used for sampling of liquids in tanks.

Sampling Tube Procedure

a) Mark information and location onto the appropriate inventory control form or input this data electronically into the inventory data base.

b) Remove cover from sample container.

c) Insert tubing to the bottom of the container to be sampled or until a solid layer is encountered.

d) Allow the waste material in the container to reach its natural level in the tube.

e) Cap the top of the tube with a stopper, finger or thumb, using care to prevent contact with the waste.

f) Carefully remove the capped tube from the sample source and insert the uncapped end in the sample container.

g) Carefully release the cap and allow the contents of the tube to drain completely into the sample container.

h) Remove the tube from the sample container and either deposit the tube in a separate container specified for sample tube disposal or decontaminate the tube for reuse.

i) Secure the lid of the sample container.

j) Affix the bar coded inventory number on the sample container (See Inventory Plan).

Sampling Bomb Procedure

a) Mark the information and location onto the appropriate inventory control form or input this data electronically into the inventory data base.

b) Remove cover from sample container.

c) Allow the bomb to fall to the bottom of the tank or until a solid layer of materials is encountered and record the depth.

d) Open and close the bomb to obtain a sample.

e) Repeat procedure to take samples in the middle and top levels.

f) Carefully remove the bomb from the sample source and release the material into the sample container.

g) Place bomb in the designated area for decontamination prior to its next use.

h) Secure lid of the sample container.

i) Affix bar coded inventory number on sample container.

Does this result in discrete samples of the three layers or one composit sample.

9.0 SAMPLE IDENTIFICATION

Samples will be taken from all drums and tanks. Each of the drum and tank samples will be marked with a unique bar code identification number which will allow tracking of any samples and their analytical results back to their specific origin.

all or only those containing liquids?

All samples will be retained and stored onsite in the Main Building. Samples sent offsite for analysis will be returned with the results. Offsite shipments of samples for analysis will be accompanied by a Chain of Custody Record (Appendix C).

10. SAMPLING METHODS

The procedures for taking surface soil, water, sediment and other samples are described in the TSCA Inspection Manual (See Appendix D). This manual describes the equipment to use, the volume of the sample and the procedures to be used for taking the samples. Also included in Appendix D is the CWM procedure for conducting wipe samples in the event that these are required.

The protective clothing to be worn by personnel taking the samples is determined by the requirements of Section 4.0 of the Heath and Safety Plan. The level of protective equipment (A, B, C or D) is identified on the Exclusion Area Site Map. Work practices including decontamination procedures are described in this Health and Safety Plan.

ROSE CHEMICALS SITE

PHASE 1

SAMPLING PLAN

11.0 ANALYSIS OF SAMPLES

Samples requiring analysis will be submitted to Langston Laboratories in Kansas, for analysis by EPA approved procedures. Analysis detection limits will be as established by these procedures, e.g. soil and sludge = 0.2 ppm, water = 0.1 ppb, and air = 0.25 ug/m3.

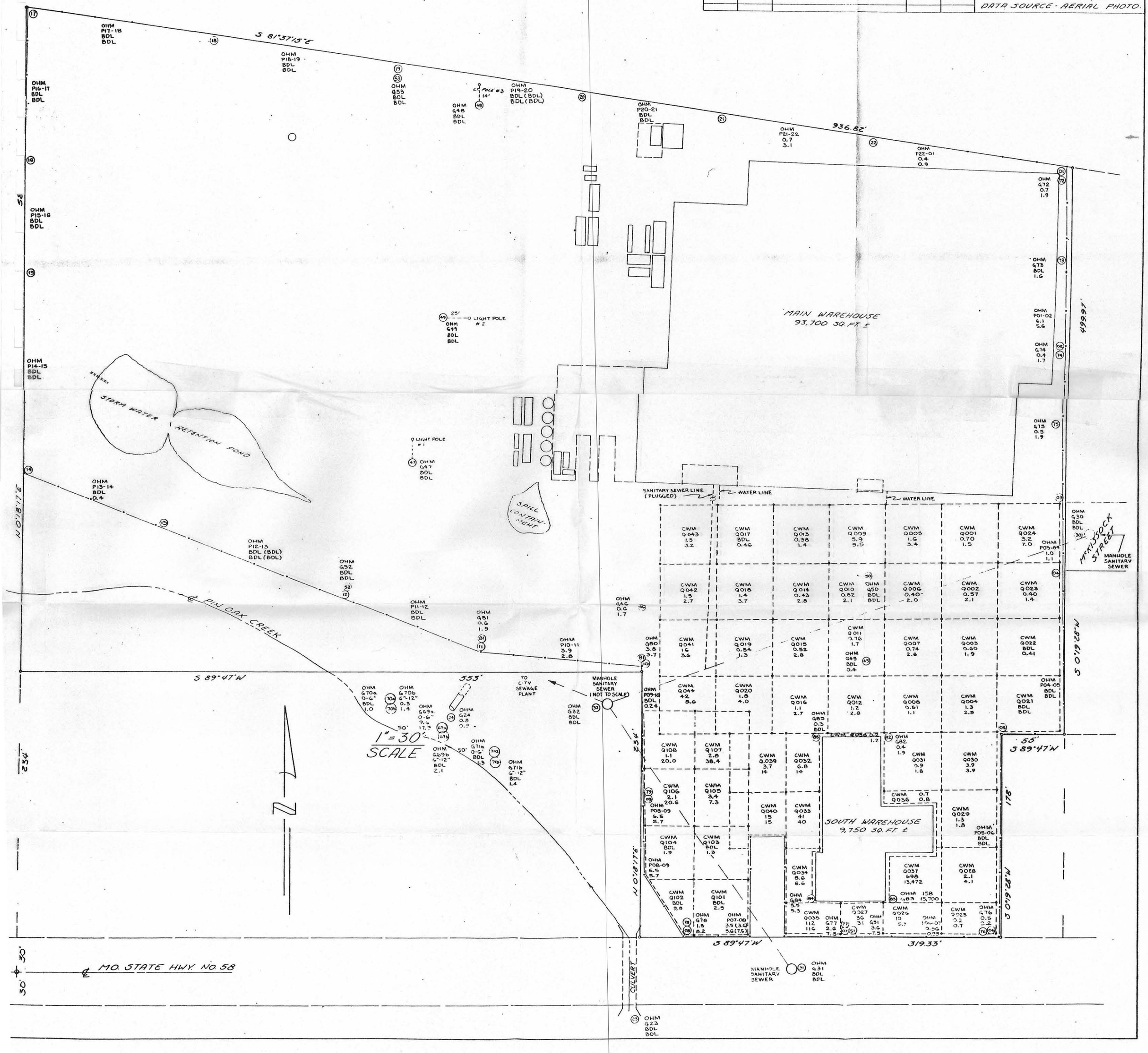
In addition to splitting approximately every fifteenth sample for submission as a blind duplicate, splits will be provided for the EPA of any sample designated by the EPA On-Scene Coordinator. Hard to do if we do not know when sampling is to take place.
As part of a QA/QC program, soils containing PCBs of known PCB content (standards or quality control samples) will be submitted occasionally as an on-going check on the quality of the analyses. Such samples will be submitted at the rate of one for every 20 site soil samples.

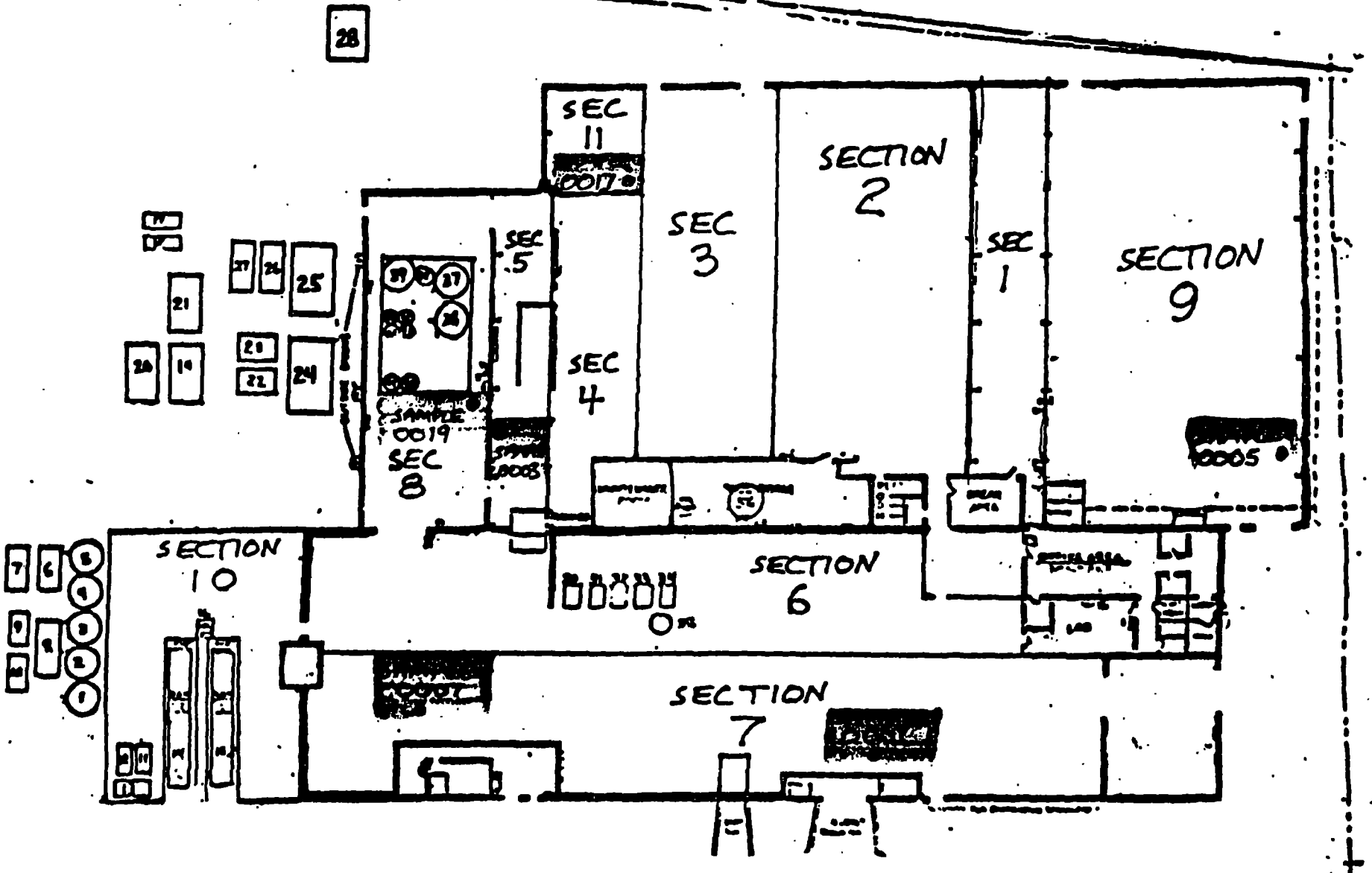
REVS. NO.	DATE	REMARKS	APPROVED	DATE
1	1-15-87	ADDED PAD OUTLETS, SEWER & CULVERT, WATER & SEWER LINES, BLDG. DOOR, & SAMPLE RESULT DATA.		

ROSE CHEMICAL CLEAN-UP SITE
HOLDEN, MO. 64040

PROJECT MANAGEMENT BY:
CLEAN SITES INC.
1199 NORTH FAIRFAX STREET
ALEXANDRIA, VA. 22314

BASE MAP: DEC. 31ST, 1986
SHERMAN & BOWERS SURVEY CO.
BOX 71, HARRISONVILLE, MO. 64701
DATA SOURCE - AERIAL PHOTO.





AIR MONITORING
AREA SAMPLE
LOCATIONS

SOUTH WAREHOUSE

APPENDIX B

APPENDIX C

CHAIN OF CUSTODY RECORD
PCB Materials

Collector's Sample No. _____
_____
_____

Grid Location of Sample: ____ I.D. Number: _____

____ Other: _____

Company's Name _____ Telephone (___) _____

Address _____
number street city state zip

Collector's Name _____ Telephone (___) _____

Date Sampled _____ Time Sampled _____ hours

Waste Type Code _____ Other _____

Sample Allocation:

1. _____
name of organization

2. _____
name of organization

Chain of Possession:

	signature	title	location	incl. dates
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____

SURFACE SOIL AND GRAVEL

Equipment

- Prepared aluminum or teflon scoop or laboratory spatula (washed with soap and water, rinsed with distilled water and methylene chloride or hexane, and wrapped in aluminum foil)
- Clean glass sample containers, caps
- Rubber gloves
- Sample bags and seals
- Plastic disposal bag

Site Selection

If area of suspected contamination is small take sample from center of area. If large see Site Selection procedures p. 2-76.

Volume

100-500 grams

Procedures

- Use rubber gloves
- Remove foil from sampler. Scoop to a depth of one-quarter to one-half inch (one inch maximum depth).
- Collect 100-500 grams; deposit in sample container. Cap.
- Seal, identify, and log samples.
- Dispose of contaminated equipment or store for decontamination.

SOIL CORE SAMPLES

Equipment

- Piston corer equipped with a methylene chloride-washed Shelby core tube or a hexane-rinsed metallic coring device
- Clean sample containers of sufficient size to contain cored sample of 3-4 inches.
- Aluminum foil (hexane-rinsed)
- Sample bags and seals
- Rubber gloves
- Plastic disposal bags

Site Selection

If the area is small, core samples should be taken at the center and edge of the area. In larger areas Site Selection procedures (p. 2-76) should be followed.

Volume

Cores of 3-4 inches should be taken initially. Deeper samples may be required later.

Procedures

- Use rubber gloves.
- Use the corer to obtain a 3-4 inch sample. Displace compacted surface soil with a shovel or laboratory spatula if necessary.
- Extrude sample into hexane-rinsed foil and wrap.
- Label top and bottom of sample.
- Place sample in container. Cap.
- Seal, identify, and log samples.
- Dispose of contaminated equipment or store for decontamination.

WATER

Water sampling requires special attention. Because of the chemical properties of PCBs and because other substances may be present in the water, PCBs may be present as a bottom layer, surface film, emulsion, solution, or as a combination of these forms. Since askarel and most transformer oils are denser than water, they will normally sink to the bottom.

Equipment

- Clean, capped sample containers
- Rubber gloves
- Plastic disposal bags

Volume

100 ml to 4 l.

Storage

All water samples should be stored on ice (See Federal Register, 12/3/79 page 69502, 8.2)

Surface Samples

Site Selection

Stagnant, standing water (particularly if an oil slick is visible).

Procedures

- Use rubber gloves.
- Slowly lower a tilted sample bottle into the water until the water begins to run into it.
- Slowly turn the bottle upright keeping the lip just under the surface so that the whole sample is surface water.
- Carefully lift the bottle out of the water.
- Transfer the sample to a separate sample container. Cap.
- Seal, identify, and log the sample.
- Dispose of contaminated equipment or store for decontamination.

Subsurface Samples

Site Selection

In moving water, choose the most turbulent area where the greatest amount of mixing is taking place. Avoid quiescent areas. In still water, choose areas that appear to have an oil film on the surface.

Procedures

- Immerse a sealed sample bottle 6-12 inches below the water surface.
- Remove the bottle top to let the air escape and the bottle fill. Replace the top underwater.
- Transfer the sample to another sample container.
- Use a separate dipping vessel for each sample to prevent cross-contamination.
- Seal, identify and log samples.
- Dispose of contaminated equipment or store for decontamination.

Ground Water

Site Selection

Collect samples from a water well located down-gradient from the area of suspected contamination.

Procedures

- Open tap on supply line from well (or hand pump the well).
- Let water run at least 2-3 minutes at full flow.
- If well depth and diameter is known purge 3 to 4 times volume of casing.
- Fill sample container. Cap.
- Seal, identify, and log samples

SEDIMENT

Equipment

- Clean, capped sample containers
- Plastic* or glass coring tubes (3 feet x 1 1/2 inches)
- Peterson dredge, or
- Ekman dredge for deep sediments
- Weighted bottom dredge
- 3-gallon hexane-rinsed steel bucket
- Rubber gloves
- Plastic disposal bags

Site Selection

Take samples from the same area that surface or subsurface water samples were taken, and in the vicinity of any outfall from a contaminated site.

Volume

100 grams - 1 kg.

Procedures

I. For commonly encountered shallow sediments

- Lower glass or plastic* coring tube through the water and into the sediment. Retrieve collected sample.
- Empty contents of sample immediately into precleaned glass jars or bucket.
- As needed, remove leaves, sticks, and rocks from sediment before transferring to wide-mouth sample jar.

II. For deep sediments

- For hard bottoms of sand, gravel, etc., use a Peterson dredge; for soft bottoms use an Ekman dredge.
- Collect the sample.

* Plastic sampling equipment should be avoided when sampling PCBs. However, in collecting sediment samples, plastic may be used if contact time is minimal.

- Empty contents into a hexane-rinsed 3-gallon steel bucket.
- Allow sediment to settle.
- Slowly pour off water, remove sticks, leaves, and stones as required.
- Transfer one quart of the sediment to a clean, wide-mouth sample jar. Cap.
- Seal, identify, and log samples.
- Store samples on ice for shipment to laboratory.

OTHER SAMPLES

Wood

Procedures

- Collect an intact piece of wood, if possible, from the contaminated area.
- Surface samples can be collected using a chisel. A hole saw can also be used.
- Wrap sample in hexane-rinsed aluminum foil.
- Seal, identify, and log the sample.

Other Samples

Guidance on other types of samples such as dust, foliage, animals, etc. is available from the Compliance Monitoring Branch, PTSED.

SAMPLE SITE SELECTION (Spills)

Source: RCRA Policy and Program Guidance Memorandum #0-1

Procedures to determine the extent and level of contamination of a PCB spill are based on a three-dimensional plot of the suspected zone of contamination that identifies the contamination area and locates specifics points and depths at which samples should be taken.

Zone Plot (See figure 1)

1. Plot the perimeter and depth dimensions of the suspected zone of of contamination.

2. On the plot, establish transects that intersect through the approximate center of the zone. These transects will divide the zone into segments.

3. Plot samples to be taken at the following points:

   - Intersections of the perimeter and transects
   - Intersection of the transects (center of zone)
   - Approximate center of each segment formed by transects

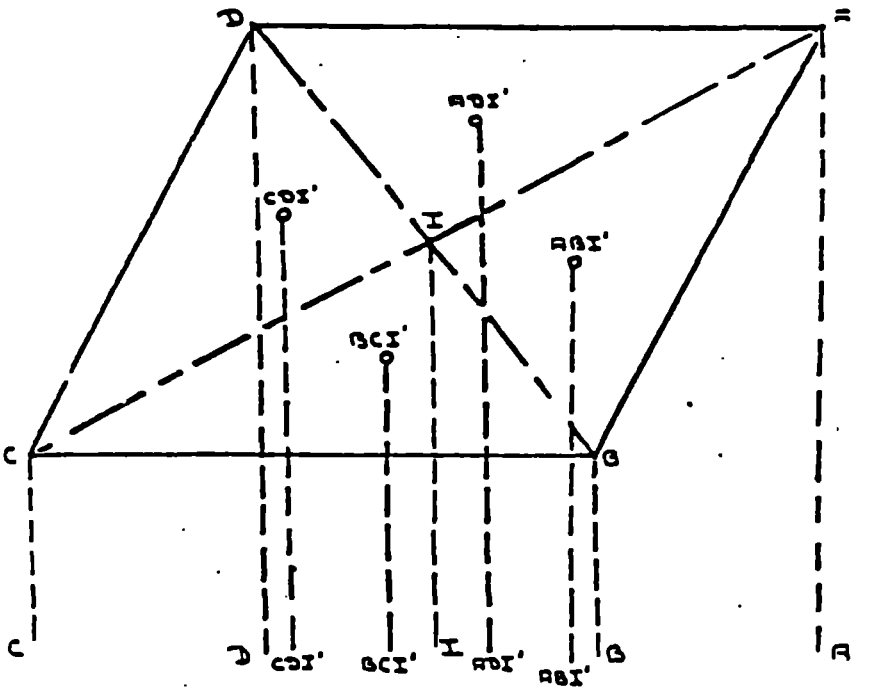
   Surface samples should be 500 gram samples taken at a depth no greater than one inch.

   Subsurface samples should be collected at the depth of suspected contamination. Refer to guidelines for core samples, page 2-71.

Sampling

Once sampling sites have been plotted, samples should be collected in accordance with the guidelines and the procedures listed on pages 2-66 through 2-75.

When excavation activities are believed to be completed, samples should be taken at the excavated depth to determine if the excavation process has caused contamination at depths below the originally defined zone of contamination.



KEY

Perimeter of Suspected Area- ABCD
Subsurface Samples
Perimeter Intersection of the Transects- AA, BB, CC, DD
Intersection of the Transects at the Approximate Center of the Suspected Area- II
Approximate Center of Each Segment Formed by the Perimeter and the Transects- ABI'ABI', BCI'BCI', CDI'CDI', ADI'ADI'

Figure 1

SAMPLING PROCEDURE
CHEMICAL WASTE MANAGEMENT

PCB Wipe Test

Reagents and Apparatus

1) Long handled cotton tip swabs
2) Pesticide grade hexane
3) Concentrated sulfuric acid
4) 15ml Teflon capped glass vials

Procedure:

1) Wipe the cotton tip of a swab with hexane, exercising care to remove excess hexane. The swab should be damp with hexane, not dripping.
2) Wipe an area 10cm x 10cm ($100cm^2$. The area should be wiped both horizontally and vertically. A 10cm x 10 cm template should be used to assure that the areas wiped are constant.
3) Break off the cotton tip of the swab, place in a 15ml vial, and cap the vial. Transport to the lab.
4) Add 5ml hexane and vortex or agitate for 30 minutes. Remove the cotton tip with forceps, exercising care to squeeze out absorbed hexane. Add 2.5ml conc. sulfuric acid and vortex well. Centrifuge or allow hexane and acid layers to separate. Additional acid cleanups may be necessary for visibly dirty samples.
5) Analyze for PCB by GC/ECD using standard CWM Procedures. Calculate total micrograms of PCB in the sample. Report results in terms of ug/100cm.

$$ug/100cm^2 = \frac{A\ wipe}{A\ std} \times Conc.\ standard\ \frac{(mg)}{1} \times Vol\ (ml)$$

Where: A = Area counts of sample or standard from the GC integrator.

Vol = Final volume in ml of the prepped sample. (5ml in above procedure.

The calculation assumes a $100cm^2$ area wiped.

CWM-ENRAC QUALITY CONTROL/QUALITY ASSURANCE PLAN FOR REMEDIAL ACTION

AT THE
ROSE CHEMICALS
HOLDEN, MISSOURI

PREPARED BY:

CHEMICAL WASTE MANAGEMENT, INC.
ENVIRONMENTAL REMEDIAL ACTION DIV.
3003 Butterfield Road
Oak Brook, Illinois

Revised February 17, 1987

CHEMICAL WASTE MANAGEMENT, INC.

ENRAC DIVISION

QA/QC PLAN

ROSE CHEMICAL SITE

PHASE I

SECTION

APPENDIX

1.0 Quality Assurance/Quality Control Introduction

The objective of quality assurance/quality control (QA/QC) is to support removal action assessments at the Rose Chemicals site by establishing and maintaining project-wide procedures to ensure the scientific realizability, completeness, traceability, and comparability of all data and conclusions generated during a project. Overall conclusions will be based on an understanding of the environmental situation at a site, which is derived from data collected during various task activities. The QA/QC objective, then, encompasses and integrates the various aspects of the project (sampling, analytical, testing, and assessment) by requiring data to be representative, precise, and accurate within defined limits. Documentation, prepared, and maintained according to a document/data control system, provides the defensible evidence of unbroken custody, traceability, and adherence to prescribed protocols and planned operations.

When applied to sampling and chemical analysis, the Rose Chemicals QA/AC program has the more specific objectives of: 1) assuring that the analytical results correspond to the environmental situation at the time a sample was taken; 2) estimating the level of quality of each analytical system without requiring excessive precision, accuracy, and sensitivity determination; 3) assisting in the early recognition of deficiencies which might affect data quality; 4) enabling the laboratory to take actions to ensure data validity; and 5) enhancing the utility of all data considered in the decision-making process, by requiring simultaneous expression of limitations on data quality.

All analyses will be monitored by the inclusion of QC samples, results from which will be used to evaluate data acceptability by linking each sample with a control. Results of analytical QC will define the criteria for the acceptance of data. Failure to meet these criteria, as monitored by the Project Manager or his designated assistant will result in immediate cessation of analysis. Clarification and correction of the analytical difficulty may result in acceptance of the data, if justified, or re-analysis of all samples in the analytical lot.

Project activities as defined in written plans (work plans, methods, protocols) will be monitored and documented for compliance with these approved procedures. All documentation, including field data, laboratory data, methods, Chain-of-Custody records, and log books will be maintained and available for inspection by the CSI Project Manager.

2.0 PROJECT DESCRIPTION

2.1 Site Description

The Rose Chemical facility is located in Holden, Missouri approximately 50 miles east of Kansas City. The facility was in business for several years accepting polychlorinated biphenyl (PCB) related material and articles for processing. Early in 1986, after accepting several million pounds of PCB material, the facility ceased operations and filed for bankruptcy.

An estimated 7,500 drums remained at the facility along with over 1,300 crates which contained PCB liquids, capacitors, shredded capacitors, contaminated soil, and debris. Over 700 transformers and 60 tanks of various sizes are also present on the site.

2.2 Record of Decision Requirements

- Complete inventory and sampling of all material on-site (drums, tanks, crates, transformers);
- Eventual removal of all inventoried material (incineration or landfilled);
- Determination of further potential site mitigation through extensive sampling of soil and water in ponds and containment areas on-site.

2.3 Inventory of All Materials

An inventory will be completed utilizing bar coding scanners (hand-held input units) and an IBM Personal Computer. Each individual drum, tank, crate, or transformer will be assigned a bar code number label. All drums, crates, and transformers will be weighed, but only the drums and tanks will be sampled. The material contents of all items will be recorded. The procedure for sampling of the drums and tanks can be found in the CWM Sampling Plan.

2.4 Site Activity

The entire site will be gridded and each grid will be sampled to determine the extent of PCB contamination. The water and sediment of the holding ponds will also be sampled for PCB and other potential contaminants. The procedures for sampling for the above areas can be found in the CWM Sampling Plan.

3.0 SAMPLING PROCEDURES

3.1 Goals

Site goals are to obtain representative samples of drum contents, associated soil, oil and debris surrounding soil from sampling grids and site water containment areas for analysis and determination of potential treatment and/or disposal. Additionally, sample results will provide the basis for further remediation as required.

To obtain these goals, the CWM-ENRAC Sampling Plan has been developed specifically for sampling of the wastes at the Rose site. These wastes include: drums, crates, transformers, on-site surface water and possible soil excavations.

Sampling methods for the Rose site will be in accordance with those listed in EPA SW-846, July 1982 and "Characterization of Hazardous Waste Sites - A Methods Manual", Vol. II, EPA-600/4-84-076.

3.2 Scope

Based on a review of the existing data, the following determinations were made:

1. Sampling of all drums could proceed with relative ease due to their accessibility.
2. Sampling of crates was considered to be unnecessary due to contents (debris, capacitors, shredded capacitors).
3. Sampling of tanks could proceed with little difficulty pending height and top accessibility.
4. Sampling of soil would be completed on a grid system of entire property.

3.3 Sampling and Guidelines

All drums and tanks will be sampled and analyzed so that the contents of each drum could be classified properly for bulking according to hazard class and compatibility.

3.4 Sample Decontamination

To minimize the possibility of cross-contamination between samples, samplers being reused will be thoroughly decontaminated by the field sampling team. The following procedure references the methods to be applied to the samplers used in the field.

Procedures:

1. After sampling of a container or area is completed, the sampler will be decontaminated or disgarded.
2. Wipe any excess sample from the sampler with disposable paper toweling.
3. Thoroughly rinse the sampler with distilled water.
4. Wipe the sampler dry with the paper toweling.
5. Repeat Steps 3 and 4 to achieve a triple rinsing of the sampling equipment.
6. Proceed to next sampling location.

The sample tubes used for the drums are dedicated to one drum only, then disgarded. The above decontamination method is employed for the tools during the tank sampling, the surface soil sampling and the water containment sampling.

3.5 Sampling, Preservation, and Handling

In order to maintain sample integrity, sample preservatives are not normally added in the field. If applicable and when deemed appropriate, sample preservatives will be employed as specified in analytical methods in accordance with EPA SW-846, July 1982. Sample containers will be filled as completely as possible so as to minimize head space/dead volume. All samples will be refrigerated if it has been determined that this

treatment will not affect the sample integrity and will be analyzed as soon as possible. In most cases, samples are sent to the chosen lab via an overnight delivery company the same day the sample was obtained.

4.0 SAMPLE CUSTODY

4.1 Objectives

Proper sample custody procedures assure the sample integrity from the time the sample is taken by field personnel, received by the laboratory, and continues throughout the entire analytical scheme including retention and proper disposal. As few people as possible should handle the sample.

4.2 Custody Procedures

All custody records (sample label, chain-of-custody, certification of representative sample, etc.) shall be originated by field personnel and should accompany the sample container at the time it is collected. The sample record should contain the following information:

- Sample I.D.;
- Date and time taken;
- Source of the sample (include sample type and name);
- Analysis required;
- Signature of person collecting sample.

When transferring the possession of samples, the transferee should sign and record the date the transfer took place on the Chain of Custody (attached with appendices).

The Sample Data/Control personnel at the selected lab shall receive and verify the integrity of the samples and associated paperwork.

4.3 Laboratory Custody Procedures

The selected laboratory assumes the responsibility for the integrity and security of the samples upon receipt once the transfer is complete. When reporting results, a copy of the Chain of Custody will be returned with analytical data forms.

APPENDIX B

1.0 DIRECTIONS FOR SUBMITTING SAMPLES TO THE RIVERDALE CENTER FOR ANALYSIS

In order to facilitate the sample tracking procedure used at the Riverdale Center Analytical Laboratories, the following procedure is to be used for all shipments (except Quality Control Samples):

1. A completed Chain-of-Custody form enclosed with the sample (attached).

2. A phone call to the Sample Receiving Group (312/841-8360) Extensions 280, 264, 267, or 258) made to include the following information at least 24 hours in advance:

   A. Number of Samples
   B. Type of Analysis Required
   C. Date (to be) Shipped and Method of Shipment (Federal Express, UPS, other)
   D. Estimated date of arrival at Riverdale.

3. A memo documenting the above in conjunction with the Certificate of Representative Sampling (attached) and a Waste Profile Sheet (attached) (if a disposal decision is depending on analysis outcome).

Send samples to: Chemical Waste Management, Inc.
150 West 137th Street
Riverdale, IL 60627
Attention: Sample Receiving
Phone: 312/841-8360

REV. 2/17/87

The Riverdale Center will anticipate the samples and contact the sender if not received within the time period specified by sample submitter.

2.0 DIRECTIONS FOR FILLING OUT CERTIFICATION OF REPRESENTATIVE SAMPLE FORM

Note: Every Section MUST Be Filled In.

1. Indicated time and date the actual sample was taken.

2. Examples: Tanks, Composite of Drums, Process Lines, and Other Storage Containers.

3. The following devices are recommended for the listed wastes:

COLAWASA (TUBE)	Free flowing liquids and slurries that consist of several immisible liquid phases.
DIPPER	Free flowing one-layered liquids or slurries.
THIEF	Dry granules or powered wastes.
TRIER	Sticky solids, sludges, and soils.
SCOOPS, SHOVELS	Granular or powered materials. Obtain a full cross-section of the waste.

In cases where solids are mixed with liquids, use a Colawasa (tube) to sample the liquid and a scoop or dipper to obtain the solids. Obtain each proportion to the overall waste composition to insure a representative sample.

These guidelines are detailed in "EPA Test Methods for Evaluation of Solid Waste", SW-846.

4. CWM recommends a full quart sample. Larger samples are not necessary. All samples listed for priority pollutants (organics) or pesticides should be in a glass bottle. Polychlorinated Biphenyls (PCBs) would fall under this category.

5. Clean glass or plastic, one-quart, wide-mouth, screw cap bottles or jars are recommended. Paint cans are not recommended.

6. All samples must be identified by using the sample label on the certification form.

Witness verification is necessary only if the waste has not been sampled by an employee of the company generating the waste.

The sampler MUST sign and date this document along with filling in the additional sampler "Field" information.

CWM-ENRAC

SAMPLING AND ANALYTICAL RECORDING FORMS
ROSE CHEMICAL

REVISED 2/17/87

CHAIN OF CUSTODY RECORD

Hazardous Materials

Location of Sampling: ___ Producer ___ Hauler ___ Disposal Site

___ Other: _____

Company's Name _____ Telephone (___) _____

Address _____
number street city state zip

Collector's Name _____ Telephone (___) _____

Date Sampled _____ Time Sampled _____ hours

Collector Sample No.	No. of Containers	Sample Description/Source

Sample(s) Submitted to:

1. _____
name of organization

2. _____
name of organization

* Chain of Possession:

1. _____ _____ _____
signature title inclusive dates

2. _____ _____ _____
signature title inclusive dates

3. _____ _____ _____
signature title inclusive dates

4. _____ _____ _____
signature title inclusive dates

5. _____ _____ _____
signature title inclusive dates

"Certificate of Representative Sample" attached; ☐ Yes ☐ No/Explain

_____

_____

* Note: Apparent gaps/breaks in the "inclusive dates" section of the "Chain of Possession" Section are covered by site sample shipping/receiving logs.

Revised 08/26/85

DIRECTIONS FOR FILLING OUT

CERTIFICATION OF REPRESENTATIVE SAMPLE FORM

NOTE: Every section MUST be filled in.

1. Indicate time and date the actual sample was taken. The example should not be taken more than 30 days before submittal.

2. Examples: Tanks, Composite of Drums, Process Lines, and Other Storage Containers.

3. The following devices are recommended for the listed wastes:

COLAWASA (TUBE)	Free flowing liquids and slurries that consist of several immisible liquid phases.
DIPPER	Free flowing one-layered liquids or slurries.
THIEF	Dry granules or powdered wastes.
TRIER	Sticky solids, sludges, and soils.
SCOOPS, SHOVELS	Granular or powdered materials. Obtain a full cross-section of the waste.

In cases where solids are mixed with liquids, use a Colawasa (tube) to sample the liquid and a scoop or dipper to obtain the solids. Obtain each in proportion to the overall waste composition.

These guidelines are detailed in "EPA Test Methods for Evaluation of Solid Waste," SW-846.

4. CWM recommends a full quart sample. Larger samples are not necessary.

5. Clean glass or plastic, one-quart, wide-mouth, screw-cap bottles or jars. Paint cans are not recommended.

6. All samples must be identified by using the sample label on the certification form.

Witness Verification is necessary only if the waste has not been sampled by an employee of the company generating the waste.

The sampler MUST sign and date this document.

RR/gf

REV 10/30/86

SALES	CODE

WASTE PROFILE SHEET CODE

CERTIFICATION OF REPRESENTATIVE SAMPLE

GENERAL DIRECTIONS: IN ORDER TO DETERMINE WHETHER WE CAN ACCEPT THE SPECIAL WASTE DESCRIBED IN THE ABOVE NUMBERED PROFILE SHEET, WE MUST OBTAIN A REPRESENTATIVE SAMPLE OF THE WASTE. WE WILL ANALYZE THE SAMPLE TO VERIFY THE INFORMATION YOU HAVE PROVIDED US, SO IT IS PARTICULARLY IMPORTANT THAT THE SAMPLE BE TRULY REPRESENTATIVE. IN MOST CIRCUMSTANCES YOU WILL BE OBTAINING THE SAMPLE. HOWEVER, IN THOSE CASES IN WHICH WE OBTAIN THE SAMPLE, WE MUST ASK THAT ONE OF YOUR EMPLOYEES BE PRESENT TO DIRECT THE PARTICULAR SOURCE TO BE SAMPLED AND TO WITNESS THE SAMPLING. IN SUCH CASE, YOUR EMPLOYEE MUST SIGN THIS CERTIFICATION AS A WITNESS.

THIS CERTIFICATION MUST BE RETURNED, WITH THE REPRESENTATIVE WASTE SAMPLE, TO:

_____

_____

_____

_____

THE UNDERSIGNED CERTIFIES THAT HE/SHE OBTAINED A REPRESENTATIVE SAMPLE OF THE WASTE MATERIAL DESCRIBED IN THE "GENERATOR'S WASTE MATERIAL PROFILE SHEET" ABOVE REFERENCED, AND THAT THE FOLLOWING REPRESENTATIONS ARE TRUE AND CORRECT:

1. HOUR AND DATE OF SAMPLING: _____
2. SOURCE FROM WHICH SAMPLE TAKEN: _____
   _____
   _____
3. EQUIPMENT AND SAMPLING METHOD USED: _____
   _____
   _____
   _____
4. AMOUNT OF SAMPLE OBTAINED: _____
5. TYPE OF CONTAINER INTO WHICH SAMPLE WAS PLACED: _____
   _____
6. THE SAMPLING EQUIPMENT USED, AND THE CONTAINER INTO WHICH THE SAMPLE WAS PLACED, WERE THEMSELVES UNCONTAMINATED BEFORE USE.
7. AT THE TIME OF SAMPLING I AFFIXED A LABEL TO THE CONTAINER IN THE FOLLOWING FORM WITH THE FOLLOWING INFORMATION (FILL IN THIS PORTION, INCLUDING YOUR SIGNATURE, JUST AS IT APPEARS ON THE LABEL YOU PREPARED):

GENERATOR:
WASTE NAME:
SAMPLE HOUR/DATE:
PROFILE SHEET CODE:
SAMPLER SIGNATURE:

WITNESS VERIFICATION: I WAS PERSONALLY PRESENT DURING THE SAMPLING DESCRIBED. I DIRECTED THE WASTE SOURCE TO BE SAMPLED, AND I VERIFY THE INFORMATION ABOVE NOTED.

WITNESS: _____

SIGNATURE: _____

TITLE: _____

EMPLOYER: _____

DATE: _____

SAMPLER NAME: _____

SIGNATURE: _____

TITLE: _____

EMPLOYER: _____

DATE: _____

LABORATORY REVIEW OF SAMPLING PROTOCOL:

BASED UPON MY REVIEW OF THE ABOVE PROFILE SHEET, I CONCLUDE THAT THE ABOVE METHODOLOGY IS

( ) ADEQUATE FOR YIELDING A REPRESENTATIVE SAMPLE

( ) INADEQUATE FOR THE REASONS NOTED HERE:

DATE: _____

LAB MGR. _____

SPECIAL WASTE ANALYSIS REPORT

This Report is intended for the sole use and benefit of Waste Management and its companies. No representation concerning significance of the reported data is made to any other person or entity.

WASTE PROFILE SHEET CODE

FROM SAMPLE CONTAINER

LABORATORY NAME: _____

ADDRESS: _____

DATE SAMPLE RECEIVED AT LAB: _____

LAB SAMPLE NUMBER ASSIGNED: _____

CERTIFICATION: Except as explicitly noted, all analytical data reported below were obtained under my direction and supervision, using sample preparation and analytical methods and analytical equipment specified or approved in the most recent "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods," SW 846, USEPA Office of Solid Waste. This laboratory follows a quality assurance control program, including a sample chain of custody procedure.

DATE OF REPORT: _____ SIGNATURE:

LAB MANAGER NAME: Dr. E. Scott Tucker

PHYSICAL CHARACTERISTICS OF WASTE — INCIDENTAL

SAMPLE VOLUME	COLOR	ODOR: ☐ NONE ☐ MILD ☐ STRONG DESCRIBE _____	PHYSICAL STATE @ 70°F ☐ SOLID ☐ SEMI-SOLID ☐ LIQUID ☐ POWDER	LAYERS ☐ MULTILAYERED ☐ BI-LAYERED ☐ SINGLE PHASED	FREE LIQUIDS ☐ YES ☐ NO VOLUME ____ %

Test	As Received	Extraction Procedure	Date of Analysis	Test	As Received	Extraction Procedure	Date of Analysis
Specific Gravity							
pH							
Acidity % as							
Alkalinity % as				Phenols, mg/l			
C.O.D. mg/l				Cyanides, as CN Total mg/l			
B.O.D. mg/l				Cyanides, as CN Free mg/l			
Total Solids @ 105°C							
Total Dissolved Solids mg/l				Nitrogen Ammonia, as N mg/l			
Residue on Evaporation @ 180°C				Total Kjeldahl Nitrogen as N mg/l			
Water as H20%							
Flash Point F°				Total Alkalinity, P as $CaCO_3$ mg/l			
Ash Content, on ignition (%)				Total Alkalinity M as $CaCO_3$, mg/l			
Heating Value, BTU/lb				Total Hardness as $CaCO_3$, mg/l			
"Acid Scrub." gNaOH/g				Calcium Hardness, as CaCO mg/l			
				Magnesium Hardness, as $CaCO_3$ mg/l			
Arsenic, as As, mg/l							
Barium, as Ba, mg/l							
Bromium as Br, mg/l				Oil and Grease, mg/l			
Cadmium, as Cd, mg/l							
Chromium, Total as Cr, mg/l							
Hexavalent Chromium as Cr, mg/l				Aldrin, mg/l			
Copper, as Cu, mg/l				Chlordane, mg/L			
Iron, Total as Fe, mg/l				DDT, mg/l			
Iron, dissolved, as Fe, mg/l				Dieldrin, mg/l			
Lead, as Pb, mg/l				Endrin, mg/l			
Manganese, as Mn, mg/l				Heptachlor, mg/l			
Magnesium, as Mg, mg/l				Lindane, mg/l			
Mercury, as Hg, mg/l				Methoxychlor, mg/l			
Nickel, as Ni, mg/l				Toxaphene, mg/l			
Selenium, as Se, mg/l				Parathion, mg/l			
Silver as Ag, mg/l				2,4, D, mg/l			
Zinc, as Zn, mg/l				2, 4, 5 TP (Silvex), mg/l			
Sodium, as Na, mg/l				PCB's, mg/l			
Potassium, as K, mg/l							
Total Sulfur, mg/l							
Chlorides, as Cl, mg/l							
Fluorides, as F, mg/l							
Nitrates, as NO_3, mg/l							
Nitrite, as NO, mg/l							
Phosphate, as P, mg/l							
Sulfate, as SO_4, mg/l							
Sulfides, as S, mg/l Dissolved				Radiation Background			

WASTE SAMPLE BENCH SHEET
SPECTROSCOPY LAB

TC-405

DATE _____

PRIORITY "1"

TECH CENTER NO: _____

PROFILE NO: _____

SOURCE: _____

LAB SUPERVISOR: _____

WASTE NAME: _____

DATE COMPLETE: _____

GENERATOR: _____

DISP SITE: _____

___ NON HAZARDOUS ___ PROVE NON-HAZARDOUS ___ HAZARDOUS

SAMPLE REP: TOTAL METALS

FINAL VOLUME |_|_|_|_|_| ml = DILUTION FACTOR |_|_|_|.|_|_|

INITIAL SAMPLE WT |_|_|_|_|.|_|_|_|_|_| gms

RESULTS:

METAL	AS RECEIVED (PPM) |_| REQ'D	E.P. TOXICITY (PPM) |_| REQ'D
AG		
AS		
BA		
CD		
CR		
CU		
HG		
NI		
PB		
SE		
ZN		
AL		
BE		
CA		
K		
MN		
MO		
SB		
TL		

HEX CR (TOTAL) _____

HEX CR (EPT) _____

COMMENTS/CALCULATIONS:

DO EPT IN GLASS JAR AND GIVE TO ORGANICS

WASTE SAMPLE SOLVENT SCREEN REPORT (GC/FIC)
-Weight % Solvents-

TCR#: Priority: "1"

Trichlorofluoromethane	_____	Methyl Isobutyl Ketone	_____
Ethyl Ether	_____	Tetrachloroethylene	_____
Methanol	_____	Butyl Acetate	_____
1,1,2-Trichloro-1,2,2-trifluoroethane	_____	Ethylbenzene	_____
Ethanol	_____	Xylenes	_____
Acetone	_____	Styrene	_____
Methylene Chloride	_____	2-Ethoxyethanol Acetate	_____
Isopropanol	_____	2-Butoxyethanol	_____
Carbon Tetrachloride	_____	Cyclohexanone	_____
Ethyl Acetate	_____	Chlorobenzene	_____
Methyl Ethyl Ketone	_____	o-Dichlorobenzene	_____
1,1,1-Trichloroethane	_____	Hydrocarbons	_____
Chloroform	_____	High-Boiling organics (B.P. 290°C.)	_____
Benzene	_____	Other Solvents:	
Trichloroethylene	_____	_____	
Isobutanol	_____	_____	
N-Butanol	_____	_____	
Toluene	_____	_____	
2-Ethoxyethanol	_____	_____	

U = Compounds on list were analyzed but not detected. Average detection limit for each compound is 0.01% by weight (100ppm).

Date Completed: ___/___/___ Sample Prep: _____

Analyst: _____

Comments: _____

Reviewed by: _____

3.0 Riverdale Laboratory Procedures

The Riverdale Center Analytical Laboratories (RCAL) assumes the responsibility for the integrity and security of the samples upon receipt once transfer is complete. When reporting results, a copy of the Chain-of-Custody form will be returned with the Special Waste Analysis Report (attached with appendices) to the sample submitter or his designate.

1. The RCAL building is securely locked between 6:00 PM and 7:00 AM. The laboratory is securely locked 24 hours/day and entrance to the lab by the front door is monitored using a sign-in book. Only authorized people may gain entrance to the laboratory by the front door and then they must be supervised by lab personnel.
2. Sample data control personnel receive the samples and provide the RCAL number for each sample bottle on the chain-of-custody record and log sample in the sample data/control computer system with all the necessary information related to sample identity.
3. Log in personnel check samples to insure that the samples are properly coordinated with log book information, chain-of-custody records, and all other pertinent information.
4. Persons designated by the laboratory supervisor are responsible for securing the samples in the appropriate active sample retention area.
5. Authorized laboratory personnel may then obtain the samples from the designated storage area. The analysts are held responsible for returning all samples to the designated active sample retention area upon completion of analyses.

6. All samples are held for a period of 90 days after all the results have been reported unless otherwise requested. All hazardous samples are then disposed of properly.
7. When samples are transferred from the lab to any other destination, the appropriate custody protocol must be used.

4.0 CALIBRATION PROCEDURES AND FREQUENCY

4.1 Instrumentation

All instrumentation must be evaluated through the use of an instrument performance check standard and calibration blank before standardization can be initiated. Divergence from acceptable benchmark criteria requires correction before analyses can be performed. Blank and instrument performance check standard results are recorded in a bound company instrument log book which will also contain evaluation parameters, benchmark criteria, and maintenance records.

A quality control solution or sample material is analyzed every day the analysis is performed to show that calibration and standardization of instrumentation is within acceptable limits. This procedure informs the laboratory that prescribed precision and accuracy are being maintained.

Standard Reference Materials (SRM) from the National Bureau of Standards, the Environmental Protection Agency, or other certifiable sources are obtained and analyzed according to normal laboratory methodology to assess and assure the accuracy of the measurement parameter.

4.2 Calibration

Calibration materials are those necessary to ensure proper instrument performance for the parameters listed. For those parameters which do not use instrumentation (e.g. cyanide), the Quality Control (QC) solution or standard is listed.

4.3 Standardization

When applied to parameters involving titrations, standardization involves comparison of a known amount of titrant to a standard. An example would be the standardization of a 1N solution of sodium hydroxide.

4.4 Precision

Precision is defined as a measure of the mutual agreement among individual measurements of the same parameter in a sample secured under the same analytical protocols. Field and lab precision will be expressed as relative percent error.

4.5 Accuracy

Accuracy is defined as the degree to which the analytical measurement reflects the true level present. Accuracy is measured by percent recovery of fortied samples.

4.6 Completeness

Completeness is defined as the percentage of valid data obtained as judged by objectives compared to the total amount of data collected.

4.7. Representativeness

Representativeness is dependent on the sampling plan.

5.0 ANALYTICAL PROCEDURES

For each measurement parameter, references applicable standard operating procedures and methods. For convenience, copies of all referenced methodologies (description) are included in Appendices.

Methodologies listed here include those required for the project and for disposal decisions at various CWM facilities.

6.0 DATA REDUCTION, VALIDATION AND REPORTING

6.1 Significant Figures

Significant figures of each type of analysis are established from the resulting data for such analyses and are reduced according to set standard rules for rounding off.

Standard Rounding Off Rules:

1. If the figure following those to be retained is less than 5, the figure is dropped, and the retained figures are kept unchanged.
2. If the figure following those to be retained is greater than 5, the figure is dropped and the last retained figure is raised by 1.
3. If the figure following those to be retained is "5" and if there are no figures other than zeros beyond the "5", the figure "5" is dropped and the last place figure retained is increased by 1 if it is an odd number; the last place figure is kept unchanged if it is an even number.
4. When an arithmetic operation with a series of numbers is performed, the result should be rounded off to the same number of decimal places as the figure with the smallest number of places after the operation is completed with all decimal places intact.
5. The preceding rules for rounding off are reasonable for most calculations, however, when dealing with two nearly equal numbers, there is a danger of loss of all significance when applied to a series of computations that rely on relatively small differences in two values. The procedure is to carry several extra figures through the

calculations and then to round off the final answer to the proper number of significant figures.

6.2 Data Reduction

How the raw data values are reduced to final form is dependent on the type of analyses and method used. The following procedures generalize the methods used to convert the raw data to final form.

Gravimetric Procedures: If a liquid sample the result is expressed in mg/l, if solid or soil, the result is expressed as mg/kg.

$$\frac{\text{A mg - B mg}}{\text{C mg or ml}} \times 1000 \text{ mg/kg or mg/l} = \text{R(mg/kg or mg/l)}$$

Where: A = Gross weight of sample with container weight
B = Tare weight of container
C = Size of sample being analyzed
R = Result

Colormetric Procedures: Sample absorbance readings are plotted on a standard calibration curve which compares concentration vs. absorbance readings of known standards. The calibration curve is calculated by a computer program which uses a least squares calculation to evaluate the correlation coefficient, slope, and y intercept of the curve.

1. Method used when standards are expressed as actual weight of parameter of interest:

$$\frac{\text{A x Dilution}}{\text{Sample size (mg or ml)}} = \text{R (mg/l or mg/kg)}$$

2. Method used when standards are expressed as weight per volume of parameter of interest when standards and samples are the same volume within the method:

$$A \times \text{Dilution} = R \text{ (mg/l or mg/kg)}$$

Where: A = The value obtained from the absorbance reading calculated by least squares program of computer.

Dilution = Ratio of sample volume to total working volume of the method.

R = Result expressed as mg/l if sample size was measured as liquid or mg/kg if sample was measured by weight.

Titrimetric Procedures:

$$\frac{V \text{ (ml) titrant} \times N \text{ (normality) of titrant} \times F \text{ (Factor)}}{\text{Sample Size}} = R \text{ (mg/l or mg/kg)}$$

"Factor" is dependent upon the type of analysis. Refer directly to referenced procedure.

Instrument Direct Results: The instrument analyzes standards of a known concentration and sets up a calibration curve dependent linear range of the instrument. The instrument readings on samples are independent of any dilution. For this reason, it is necessary to calculate the result as follows:

For ICP and AA metals:

$$\frac{A \times B}{C} = \text{Results (mg/l or mg/kg)}$$

Where: A = Direct reading result
B = Final volume of sample being analyzed
C = Initial weight or volume of samples

6.4 Validating Analytical Performance

Control charts are used to evaluate the daily analytical performance and to assure that valid data is being generated.

It is the analyst's responsibility to confirm that the specified limits for precision and accuracy on duplicates, fortified samples, and QC check samples are met using the proper control charts.

The group leader's responsibility is to review the control charts daily to assure that deviations from acceptance criteria are noted and that all outliers are addressed and resolved.

6.5 Reagent Referencing

All new reagents, quality control solutions, or stock standards, etc. prepared in the laboratory or purchased are documented in the reagent/standards book. The reagents are prepared from at least analytical reagent grade chemicals and the lot number is recorded. The lot number of the chemicals used and the date the chemicals are received are documented in the reagent/standard books.

6.6 Data Reporting

Final results on samples are reported on the CWM Special Waste Analysis Report (SWAR). The SWAR, after preparation by the Sample Data/Control Group is then reviewed, signed, and dated by the Manager of Analytical Chemistry. The SWAR report is then copied, filed numerically (according to unique sequential sample number) for future reference and kept on file for a minimum period of five years, unless otherwise specified. All final reports, after review, are released to sample submitter.

Laboratory sample tracking reports produced by the Sample Data/Control Group assist management personnel in ensuring completion schedules are met.

Strip Chart Measurement by Peak/Height: A standard calibration curve is set up for each analysis. The peak/heights of the samples compared to the standard curve and a rating is generated by the computer on the least squares program. The sample results must then be calculated for dilution.

A x Dilution = R (mg/kg or mg/l)

Where: A = Value obtained from the computer or manual comparison of calibration curve graphed.

R = Result expressed as mg/kg if by sample weight or plot mg/l if by sample volume.

Once all the results are calculated to final concentration, they are reviewed by the analyst and then reported onto sample bench sheets.

6.3 Validating Raw Data

Raw data entered into a laboratory notebook or bench/calculation sheets contains, at a minimum, the following information:

1. The date of analyses
2. Observed values
3. All calculations
4. The analyst making the measurement

Raw data from automated equipment is dated, initiated, and then becomes permanent raw data and is filed in a secure place where it can be easily retrieved.

Strip charts must contain identified peaks, the parameter being measured, and the analysts initials.

All raw data is reviewed, verified, initialed, and dated by the analyst. The verified results are then reviewed, signed, and dated by the appropriate group leader and submitted to Sample Data/Control Group.

7.0 INTERNAL QUALITY CONTROL CHECKS

7.1 General

The Quality Control practices and frequencies described in this section should take precedence over those described in analytical methods, when there is disagreement between the two.

7.2 CWM Quality Control Policy

Chemical Waste Management, Inc. has developed a program of quality control practices and procedures to insure that precision and accuracy are maintained throughout all of its laboratories. All site laboratories are required to participate in this program. Contract laboratories employed by the company must demonstrate quality control practices at least as stringent as the company's program.

The Chemical Waste Management quality control program is based on "Handbook for Analytical Quality Control in Water and Wastewater Laboratories", EPA, March 1979. Good laboratory practices which encompass sampling, sample handling, housekeeping, and safety are maintained at all laboratories. The following practices must be implemented at all site laboratories.

A. Instrument Performance Parameters

All instrumentation must be evaluated through the use of an instrument check standard and calibration blank before standardization can be initiated. Divergence from acceptable benchmark criteria specified in Quality Control Procedures Manual requires correction before analyses can be performed. Blank and instrument check standard results are recorded in a company bound instrument log book which will also contain evaluation parameters, benchmark criteria and maintenance records.

B. Contamination Evaluation

Reagent blanks must be prepared with each batch of samples and analyzed to insure that sample contamination has not occurred. Whenever possible, a field blank should be taken and analyzed accordingly. If blank analyses do not fall within acceptable limits, as specified in Quality Control Procedures Manual, modification of reagents or modification of the analytical method must be implemented.

C. Duplicate Analysis

A sample must be analyzed in duplicate for each ten samples being analyzed for a particular parameter. A blind duplicate sample will be submitted to each laboratory on a weekly basis. Results of these duplicate analyses will be reviewed weekly and reported to the Manager of Quality Control monthly. Selection of duplicate samples will be specified in the Quality Control Procedures Manual.

D. Quality Control Check Sample

A quality control solution or sample material should be analyzed at least every day to show that calibration and standardization of instrumentation is within acceptable limits. This procedure informs the laboratory that prescribed precision and accuracy are being maintained. Results of these analyses will be reported monthly to the Manager of Quality Control on the attached Quality Control Chart.

E. Fortification of Samples

Fortifications are employed to monitor recoveries and maintain extraction and/or concentration techniques at acceptable levels. This procedure provides information about the effect of the sample matrix on the analyte in questions. A ratio of one fortification for each ten samples analyzed

should be maintained. The same sample used for the duplicate analysis should be fortified according to the method prescribed in the procedures manual.

F. Reference Manual

Standard Reference Materials (SRM) from the National Bureau of Standards or from the Environmental Protection Agency should be obtained and analyzed according to normal laboratory methodology to indicate accuracy of the methods. These materials should be analyzed at least quarterly but, preferably more frequently.

G. Round Robin Analyses

All site laboratories must participate in Round Robin sample analyses. These samples will be submitted by the Manager of Quality Control and will be for the analysis of normal parameters. Results must be reported to the Manager of Quality Control before the due date. Digressions from the norms established by the majority of laboratories participating will be investigated and corrected by the Manager of Quality Control.

H. Reference Laboratory Evaluation

At least one sample per month for each parameter being analyzed must be sent to the RCAL or to a designated and approved contract laboratory for parallel analysis. These split samples should be sent to the Manager of Quality Control or a report of both results must be sent when an outside laboratory is employed.

The following information should be included with the sample:

- Waste Name
- Sample ID Number
- Analysis Requested
- Site Lab Results

Samples sent to the RCAL will be logged in and analyzed without analysts' knowledge of site lab results.

I. Reports

All laboratories must report monthly to the Manager of Quality Control the following information on the Quality Control Chart:

1. Number of samples analyzed.
2. Number and results of duplicates.
3. Number and results of fortification.
4. Instrument used.
5. Frequency of occurrence for quality control check sample within acceptable limits.
6. Mean and standard deviation of analyte in question.

All laboratories must report intralab and Round Robin results as they occur and reference material analysis at least quarterly.

J. Contract Laboratories

A written copy of the contract laboratory's Quality Control Procedures must be submitted to the Director of Analytical Chemistry prior to approval. A quality assurance inspection will be conducted by a designated compliance officer to insure that proper records and documents are present and maintained. All contract laboratories are subject to inspection and audit of all procedures while under contract with Chemical Waste Management, Inc. by the Manager of Quality Control. Contract laboratories are required to adopt and implement all of the quality control practices listed above as they are applicable to sample type and volume. A quarterly review of the contract laboratory will be conducted to assure that Quality Control of Chemical Waste Management, data is being maintained.

7.3 Frequency of Practices

Frequency of the aforementioned Quality Control practices is determined by the Lab Managers.

7.4 Documentation

Documentation of QC related activities (frequency, duplications, fortifications, etc.) are maintained in company-bound notebooks and summarized monthly in a computer generated report. The reports are submitted to and retained by the Manager of Quality Assurance/Quality Control for CWM.

8.0 PERFORMANCE AND SYSTEM AUDITS

8.1 Performance

An extensive Quality Assurance program which is in place at the RCAL requires that an internal quality control sample, a blank, and duplicate sample, and fortified sample be analyzed per the scheduled outlined. Results of these analyses are documented on charts on a daily basis.

All quality control results are reviewed by the analyst, Group Leader, Manager of Analytical Chemistry, and Manger of Quality Assurance on a monthly basis. In this way, trends in the quality control data are examined and addressed. This continual examination and evaluation of quality control data ensure sample data of high quality.

At a minimum, Standard Reference Materials (SRM's) for each parameter measured are analyzed on a quarterly basis. Results of these analyses are documented comparing certified values and target ranges to actual results.

On a monthly basis, blind duplicate samples are submitted to the laboratory. Results of these analyses are documented and outliers (greater than 20% error) are addressed.

Reference laboratory evaluations compare results of each parameter measured throughout the month to the results obtained by an outside laboratory. These results are collected and documented by the Quality Assurance/Control Group.

On a quarterly basis, the RCAL participates in an internal Round Robin analysis. Results of the analyses are accumulated by the Quality Assurance/Control Group and documented.

Collectively, these results are used to evaluate the accuracy of the procedures and to determine if the Quality Control objectives are being met.

8.2 System Audits

On a regular basis, internal quality control audits are conducted. For each parameter measured, these audits document performance in the areas of:

- Instrument Performance Check Samples
- Quality Control Check Samples
- Method Blanks
- Frequency and Performance of Duplicate/Fortified Samples
- Blind Duplicate Performance
- SRM Performance
- Reference Laboratory Evaluation
- Round Robin Performance

9.0 PREVENTIVE MAINTENANCE

The responsibility of routine care of instruments lies with the analyst and is provided during initial training and proficiency testing. Manufacturers' instrument maintenance manuals are kept on file for quick reference. Instrument log books document maintenance schedules, dates maintenance is performed, and details of each maintenance action.

Service agreements and preventive maintenance contracts are secured for all critical instruments and equipment which provide for regular checks by qualified service personnel on a "real time" (same day) basis. This is CWM standard policy to minimize down time and assure that schedule completion dates are met.

Instrument Performance Check Standards are analyzed every day the instrument is used to evaluate instrument performance before calibration can be initiated.

Critical spare parts are maintained per manufacturers' recommendation and/or prior experience.

10.0 DATA ASSESSMENT

10.1 Data File

For each parameter measured, a quality control data file is maintained. Each parameter file is updated daily and formally documented in a monthly QC report. Each file consists of a:

- QC Chart
- Duplicate Control Chart
- Fortification Control Chart

Daily documentation allows immediate attention to outliers and the observance of trends. Log books assigned to each parameter document method blanks and all calculations.

Quality control data is updated on the computer periodically with a report generated at the end of each month. This report documents the past month's activity for each parameter.

10.2 Charts and Reports

Both daily charts and the final monthly report contain graphs which delineate upper and lower limits and the mean based on cumulative past measurements. Additionally, the coefficient of variation, standard deviation, and number of measurements are displayed on the final report for review.

10.3 Calculations

The following calculations are used for the quality control assessment by the computer:

Calculation of mean values for accuracy and standard deviation for control limits and percent recovery:

$$\text{Mean} = \frac{\text{Sum of Sample Measurements}}{\text{Number of Sample Measurements}}$$

Calculation of % error on duplicate analyses:

$$\% \text{ Error} = \frac{\text{High Result - Average x 100}}{\text{Average}}$$

$$\text{Average} = \frac{\text{High Result + Low Result}}{2}$$

The standard deviations, s of a series of measurement to set control limits:

$$s = \text{square root of: } \frac{\text{Sum of Squared Results - (Sum of Results Squared/Numbered of Results}}{\text{Number of Results Minus One}}$$

$$\text{Recovery, \%} = \frac{\text{Total Analyte Found - Analyte Originally Present x 100}}{\text{Analyte Added}}$$

Coefficient of Variation, c.v.

$$\text{c.v.} = \frac{s}{x}$$

s = Standard Deviation
x = Mean of Result

10.4 Limits for Quality Control Checks

Upper and lower limits for quality control check samples, duplicates, and fortifications have been established as demonstrated as shown below.

QC Element	Upper/Lower Limits
QC Check Sample	± 3s of Mean
Duplicate	0 - 20% Error
Fortifications	80 - 120% Recovery

11.0 CORRECTIVE ACTION

11.1 Data Validation and Corrective Actions

QC Check Sample: Must fall within the QC limits. If the result is outside the limits, the following correcting actions must be taken:

- Check the data calculations.
- Check operating conditions.
- Repeat analysis.
- If result still does not fall within acceptable limits, notify Group Leader/Supervisor.
- Borderline cases should be brought to the attention of the supervisor for appropriate corrective action.

Duplicates: Should agree within 0 - 20% error or the following corrective actions are taken:

- Check the data calculations.
- Check possible matrix interferences.
- Document reason (if detected).
- If result still does not fall within acceptable limits, notify Group Leader/Supervisor.
- If no reasons can be detected, the samples in question are reanalyzed.

Fortifications: Must fall within 80 - 120% recovery or the following corrective actions are taken:

- Check data calculations.
- Check recovery calculations.
- Check for appropriateness of spike.
- Check for possible matrix interferences.
- Document reasons (if detected).
- If result still does not fall within acceptable limits, notify Group Leader/Supervisor.

- If no reasons can be detected, the samples in question are reanalyzed.

When initial instrument standard performance check is outside of control limits:

- Check reagent reference log to verify that reagents have been properly prepared and/or meet specifications.
- Rerun new standard.
- If still out of control, prepare new reagents.

When initial instrument calibration standards are out of control limits, the following corrective actions are taken:

- Check instrument maintenance log and not if any changes have been made which would effect calibration verification.
- Check reagent reference log to verify that reagents have been properly prepared and/or meet specifications.
- Rerun new standards.
- If still out of control, tune instrument according to manufacturers' specified procedure.
- Notify Group Leader/Supervisor.
- Call for service if problem cannot be resolved.

When initial GC/MS tuning standard is out of control limits:

- Check instrument maintenance log and not if any changes have been made which would effect calibration verification.
- Check reagent reference log to verify that reagents have been properly prepared and/or meet specifications.
- Rerun new standards.

- If still out of control, tune instrument according to manufacturers' specified procedure.
- Notify Group Leader/Supervisor.
- Call for service if problem cannot be resolved.

11.2 Data Validation Actions - Group Leader/Supervisor

Data validation and corrective actions to be taken by the Group Leader/Supervisor are:

- Review and verify analyst corrective actions.
- Ensure problem is addressed prior to analyzing samples.

12.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

The Group Leaders/Supervisors of each analytical group are responsible for day-to-day quality control. They are responsible for taking corrective action, providing a written report to the Manager of Analytical Chemistry, and are responsible for overall quality control of their respective laboratories and improvement of quality control actions. Quality control reports are formalized on a monthly basis to the Manger of Quality Control/Quality Assurance.

Quality assurance for field operations is the responsibility of the project manager. These individuals have specific quality assurance responsibilities in the form of the required documentation submitted with each sample. It is the responsibility of the project manager to ensure that this project plan is current and accurate or initiate revisions to any section as they become necessary.